The HDAT2 Cookbook

"How can I do...?"

Version 1.1

08.09.2010

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http://www.hdat2.com/

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Preface

This is the cookbook of program HDAT2 in pictures for beginners.

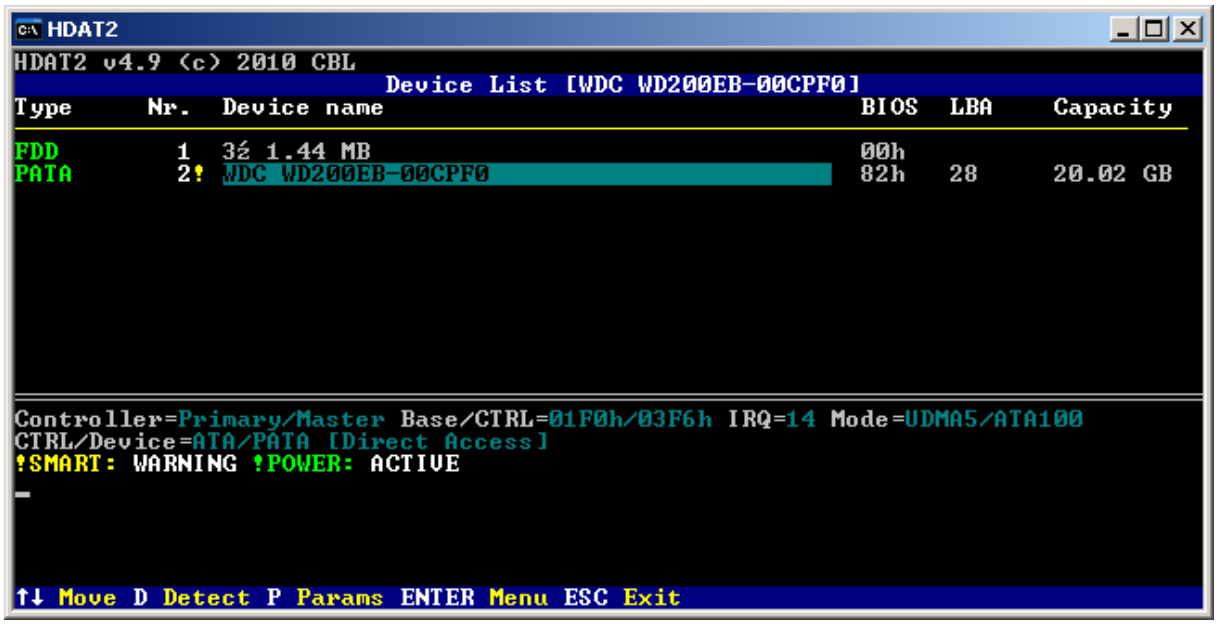
There should be the answers for questions "How can I do…?".

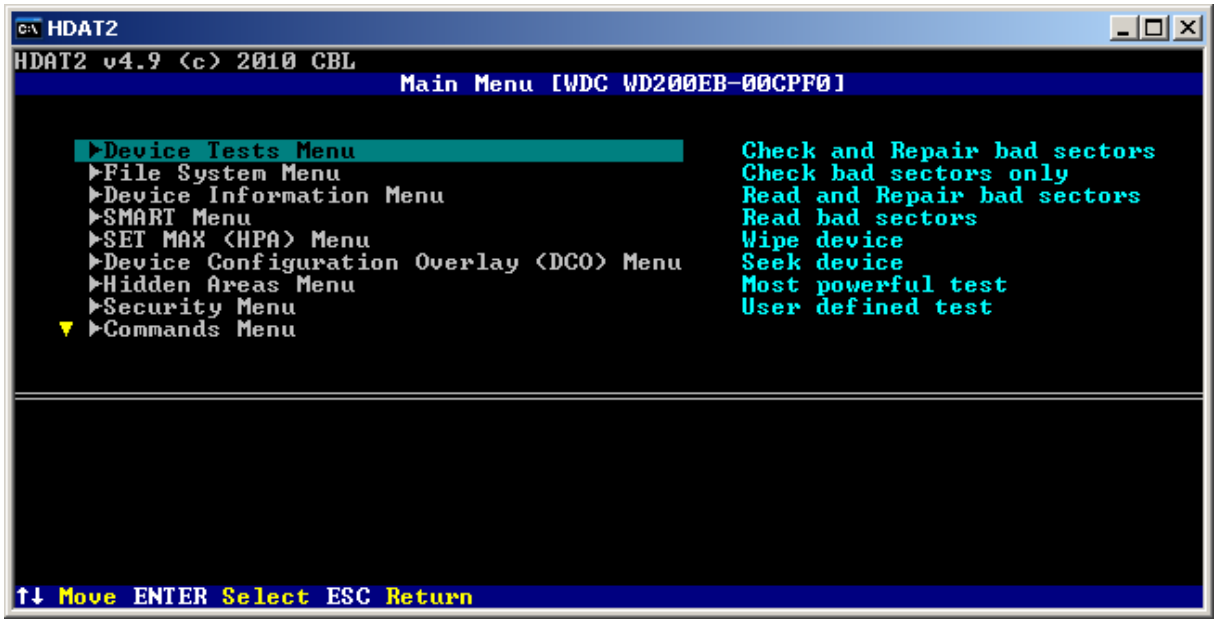
For a more detailed information see "User's Manual HDAT2".

I am sorry for my English.

Run the program

Overview


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type Nr. Device name BIOS LBA Capacity
FDD 1 3½ 1.44 MB 00h
PATA 2! WDC WD200EB-00CPF0 82h 28 20.02 GB
Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SMART: WARNING !POWER: ACTIVE
↑↓ Move D Detect P Params ENTER Menu ESC Exit



Change the native size (HPA, DCO)

Overview

The hidden area like Host Protected Area (HPA) or DCO area, is an area of a hard drive that is not normally visible to BIOS, an operating system, or user.

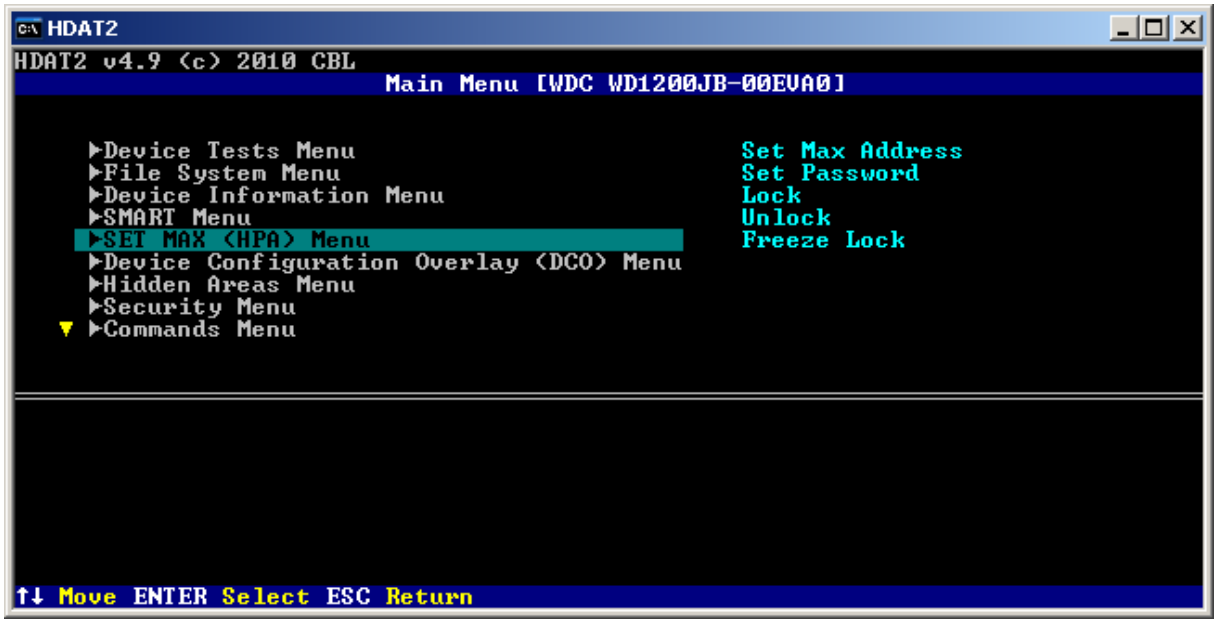
To create or remove Host Protected Area (HPA) is used the command SET MAX ADDRESS.

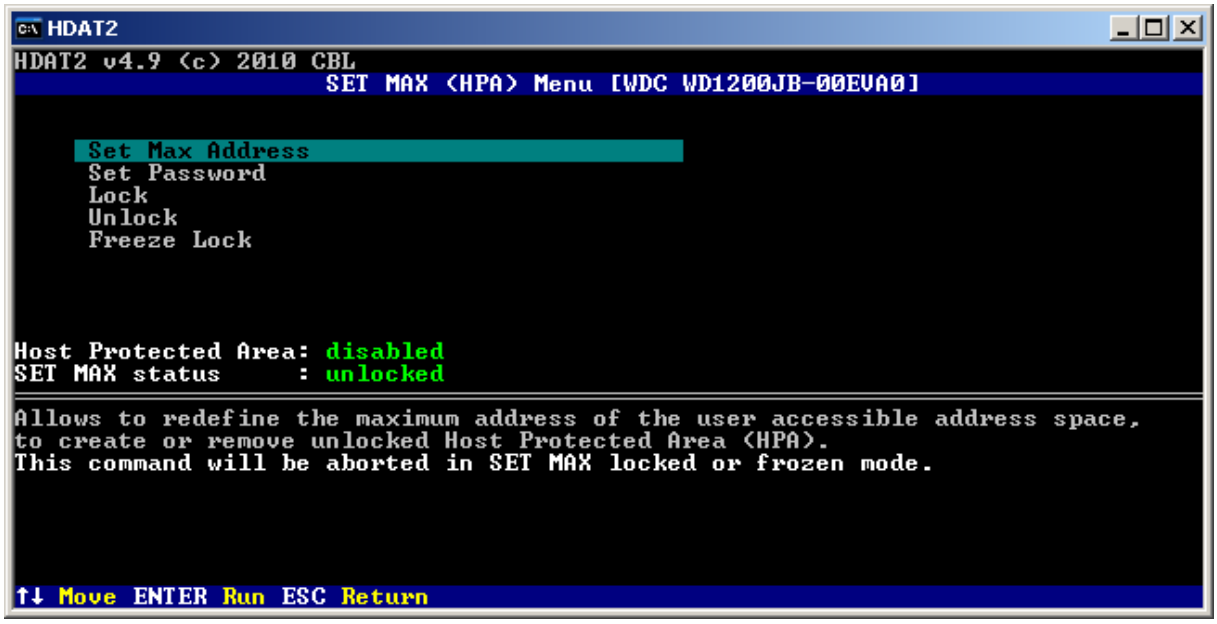
To create or remove DCO hidden area is used the command DCO MODIFY.

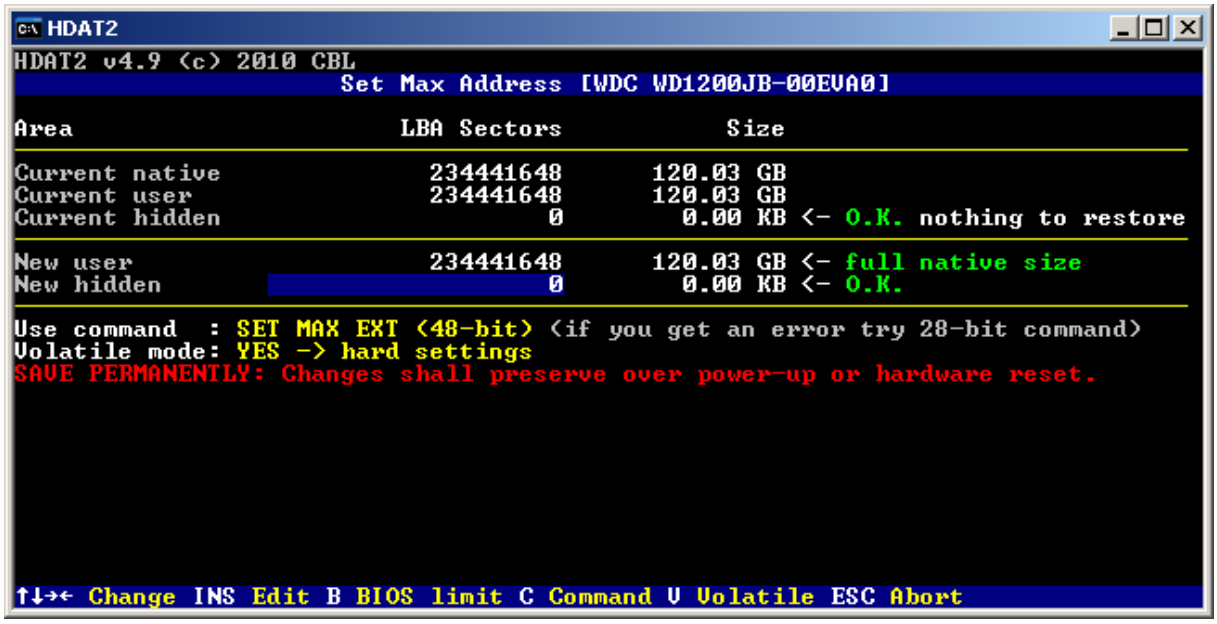
Note: To create or remove DCO area you must first remove an active HPA area. If you want to create both HPA and DCO area first you have to create DCO area without any HPA area. After power off/on you can create HPA area.

Create hidden area HPA with SET MAX ADDRESS

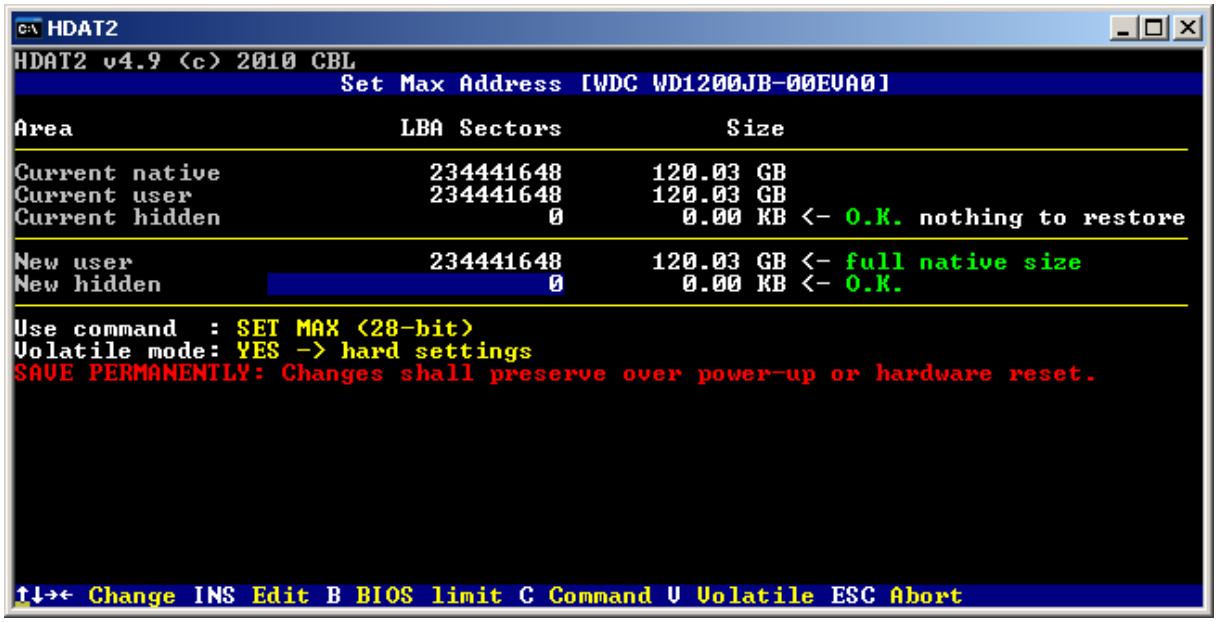
Example: We create HPA with a size of 100 sectors (50 KB).

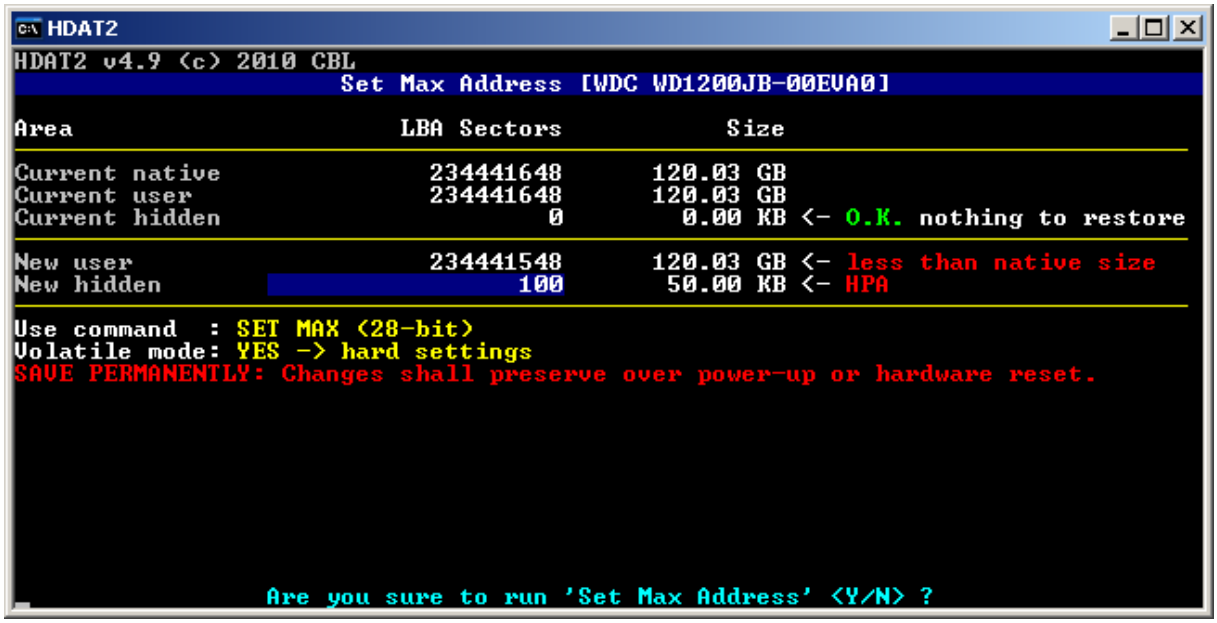


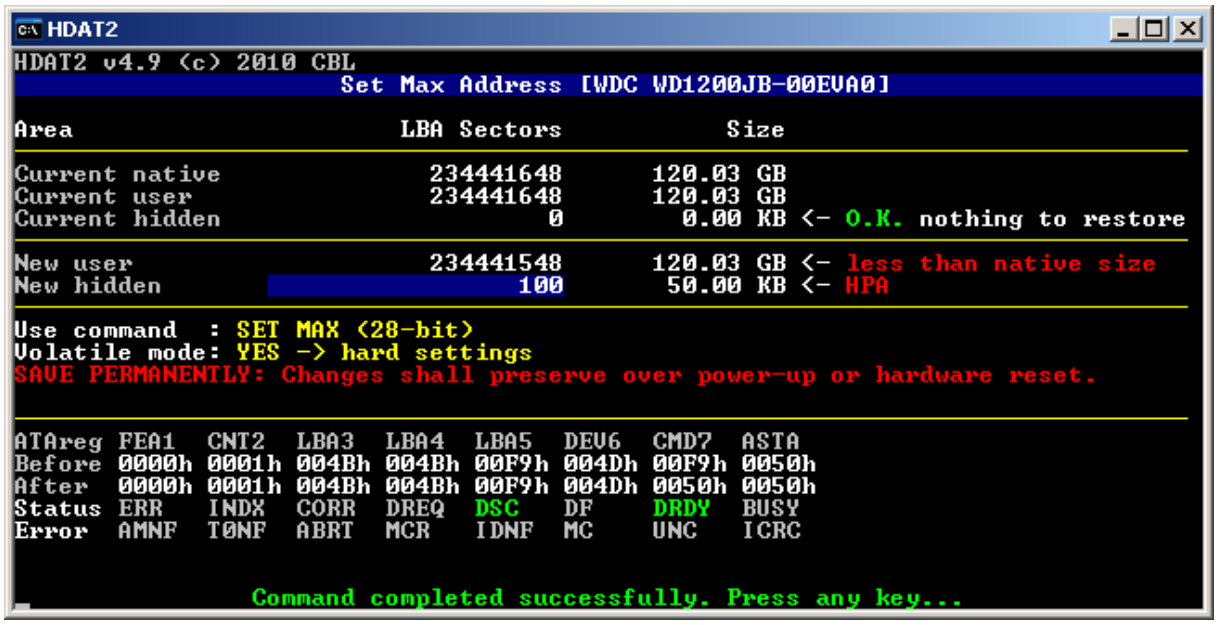


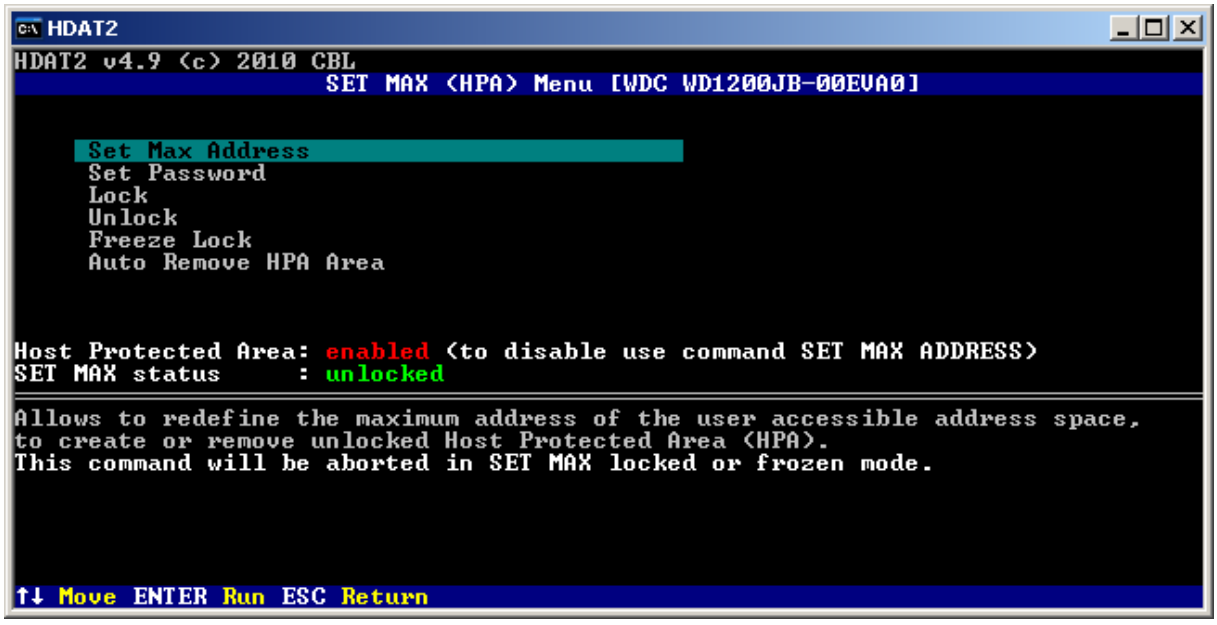


In this example we select 28-bit SET MAX command.

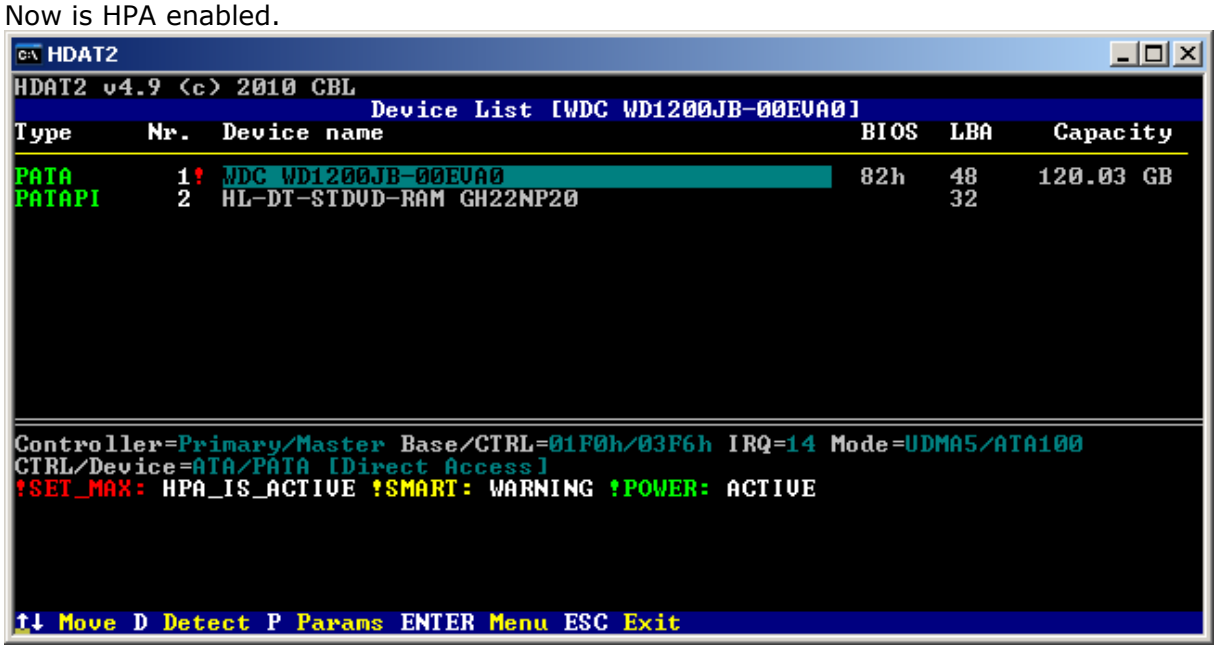



HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441648 120.03 GB
Current hidden 0 0.00 KB <- O.K. nothing to restore
New user 234441548 120.03 GB <- less than native size
New hidden 100 50.00 KB <- HPA
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
Are you sure to run 'Set Max Address' (Y/N) ?

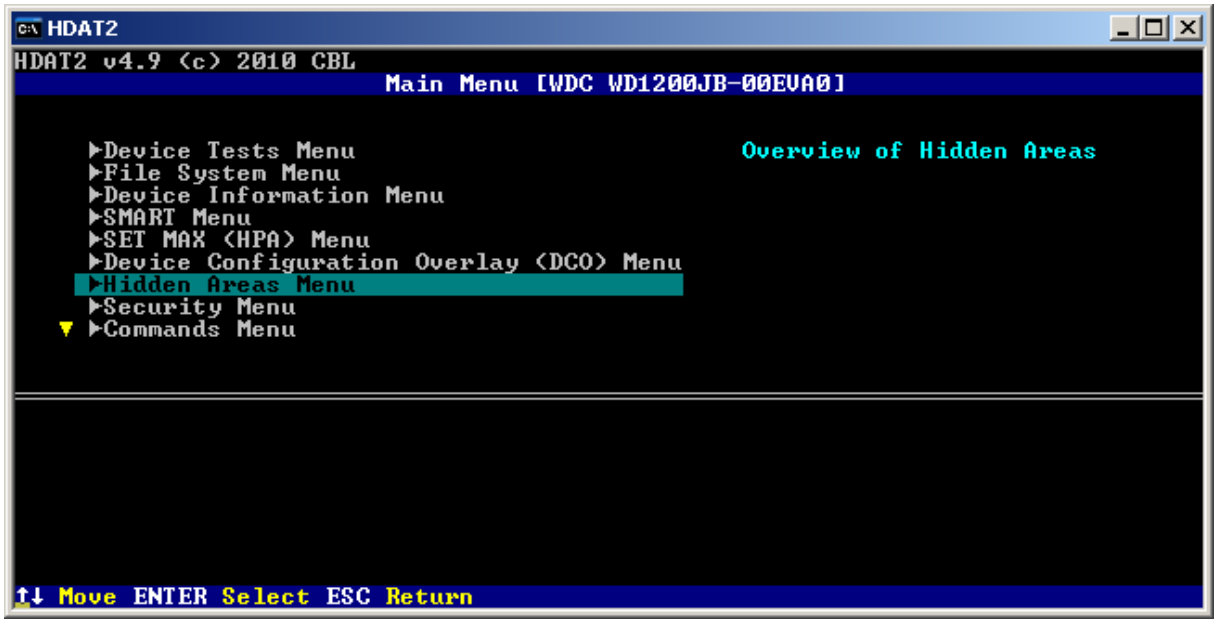

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441648 120.03 GB
Current hidden 0 0.00 KB <- O.K. nothing to restore
New user 234441548 120.03 GB <- less than native size
New hidden 100 50.00 KB <- HPA
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 0000h 0001h 004Bh 004Bh 00F9h 004Dh 00F9h 0050h
After 0000h 0001h 004Bh 004Bh 00F9h 004Dh 0050h 0050h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT MCR IDNF MC UNC ICRC
Command completed successfully. Press any key...

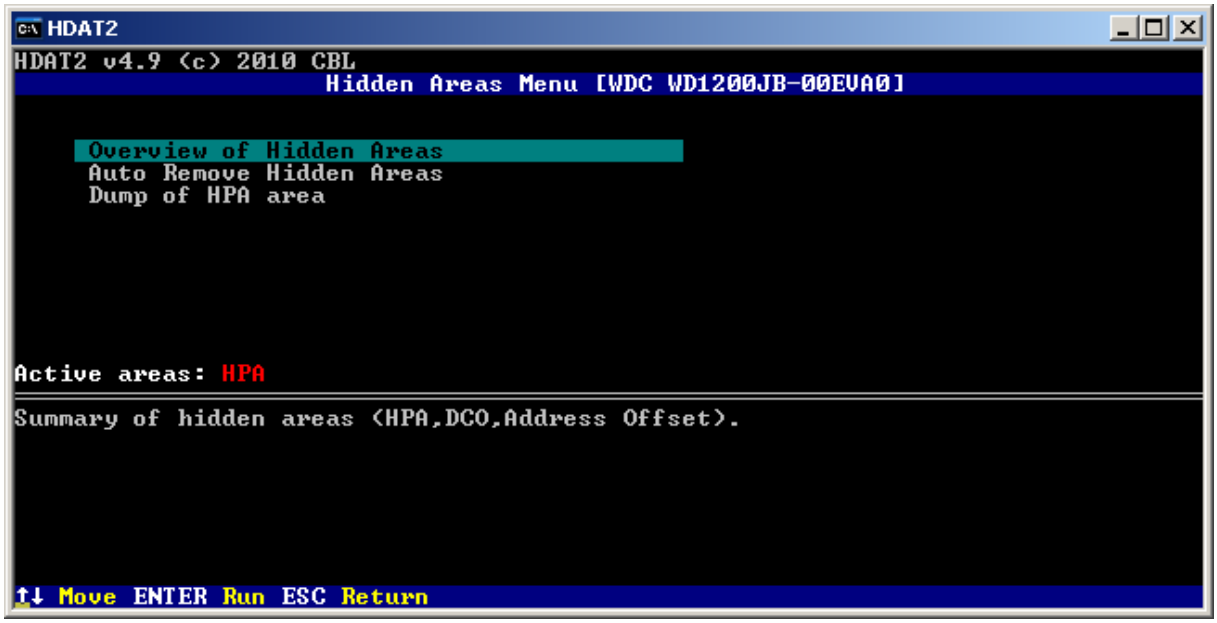

HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX (HPA) Menu [WDC WD1200JB-00EVA0]
Set Max Address
Set Password
Lock
Unlock
Freeze Lock
Auto Remove HPA Area
Host Protected Area: enabled (to disable use command SET MAX ADDRESS)
SET MAX status : unlocked
Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.
↑↓ Move ENTER Run ESC Return

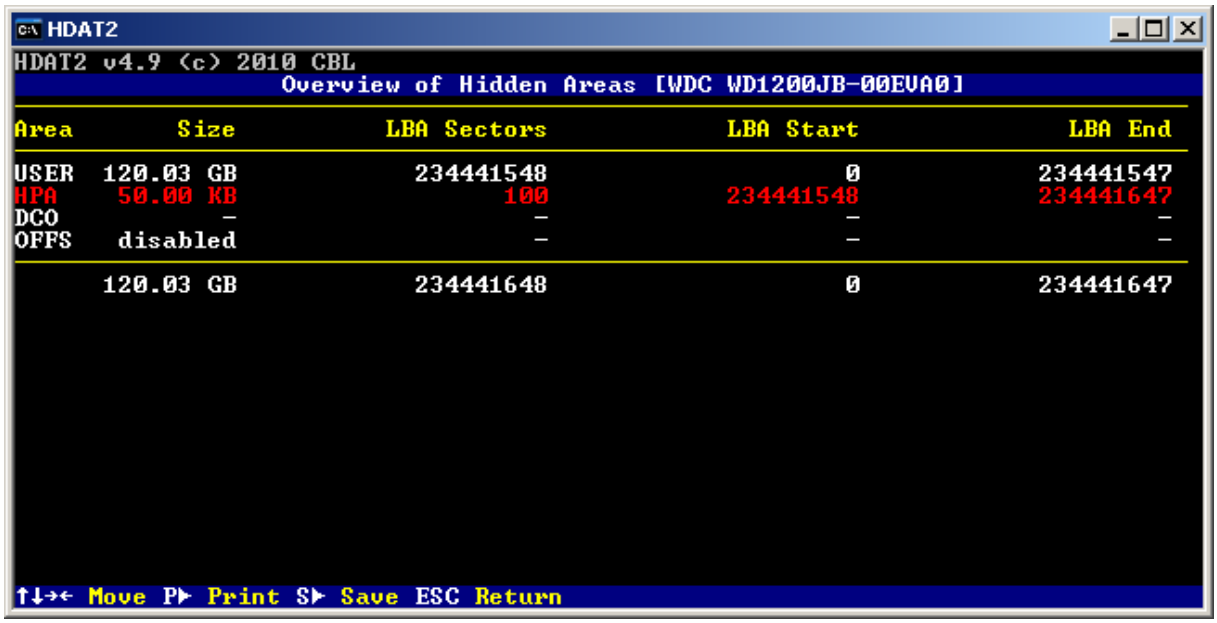
Now is HPA enabled.


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD1200JB-00EVA0]
Type Nr. Device name BIOS LBA Capacity
PATA 1! WDC WD1200JB-00EVA0 82h 48 120.03 GB
PATAPI 2 HL-DT-STDVD-RAM GH22NP20 32
Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE
↑↓ Move D Detect P Params ENTER Menu ESC Exit

Now we take a look at hidden areas.

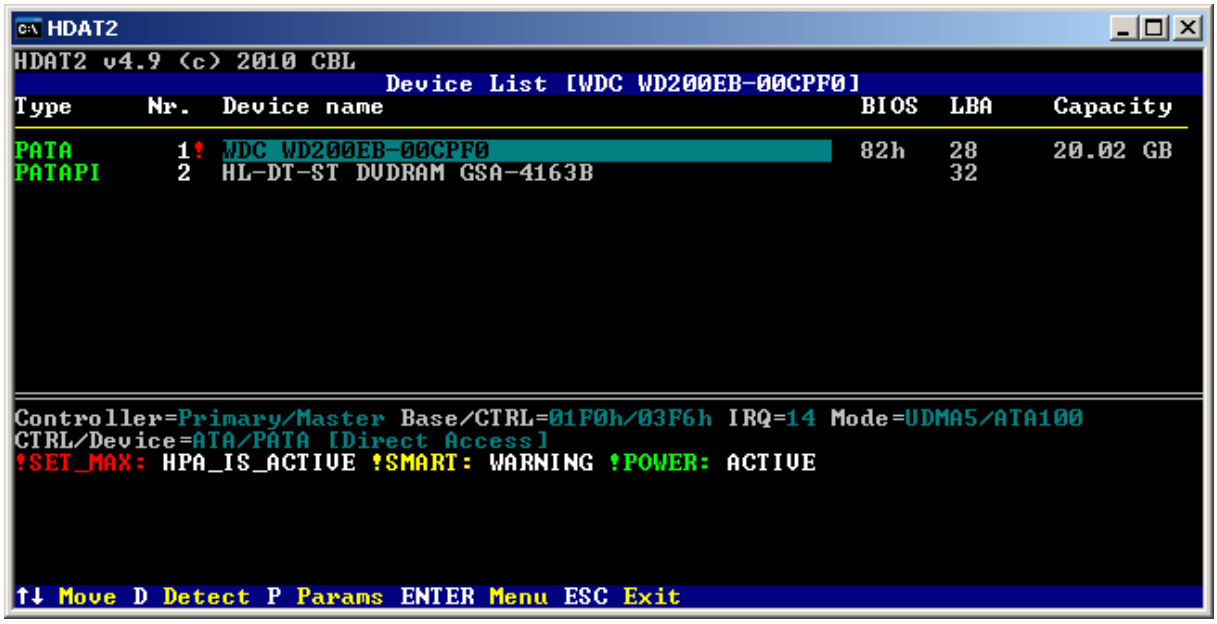


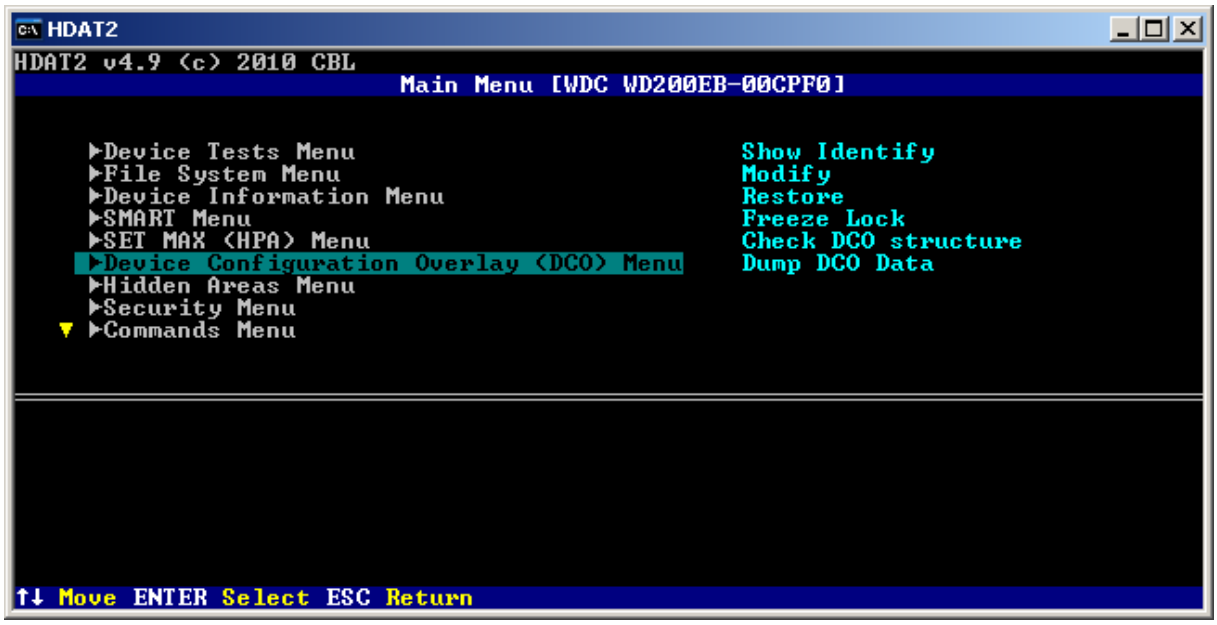

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD1200JB-00EVA0]
Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of HPA area
Active areas: HPA
Summary of hidden areas (HPA,DCO,Address Offset).
↑↓ Move ENTER Run ESC Return

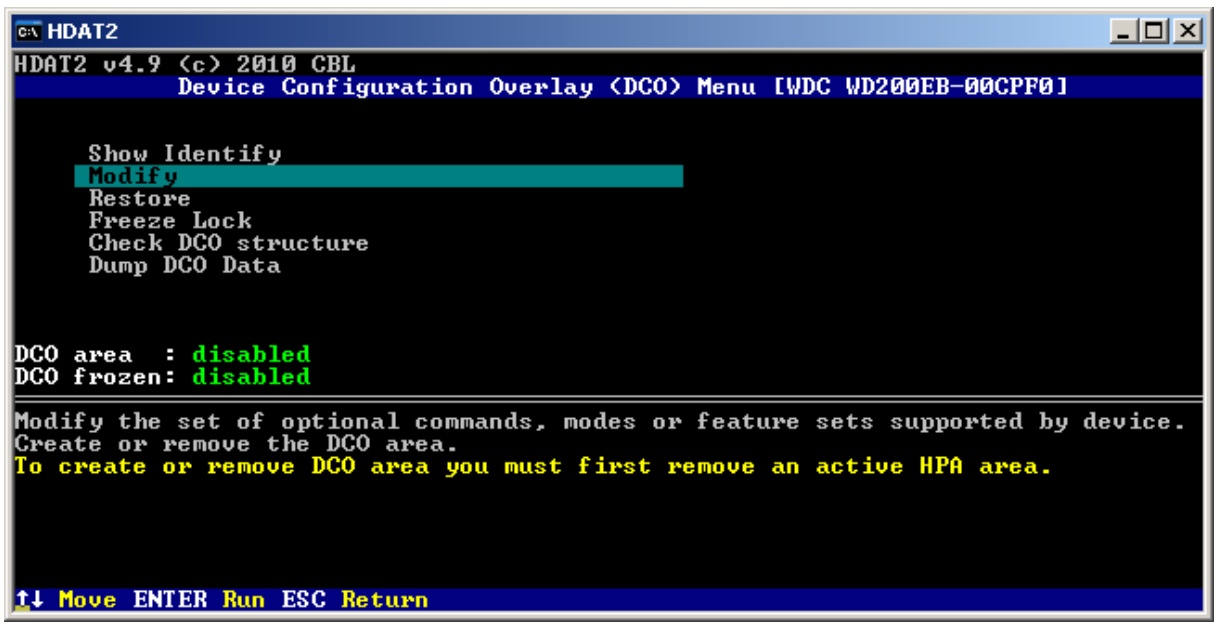

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD1200JB-00EVA0]
Area Size LBA Sectors LBA Start LBA End
USER 120.03 GB 234441548 0 234441547
HPA 50.00 KB 100 234441548 234441647
DCO - - - -
OFFS disabled - - -
120.03 GB 234441648 0 234441647
↑↓→← Move P▶ Print S▶ Save ESC Return

Create hidden area DCO

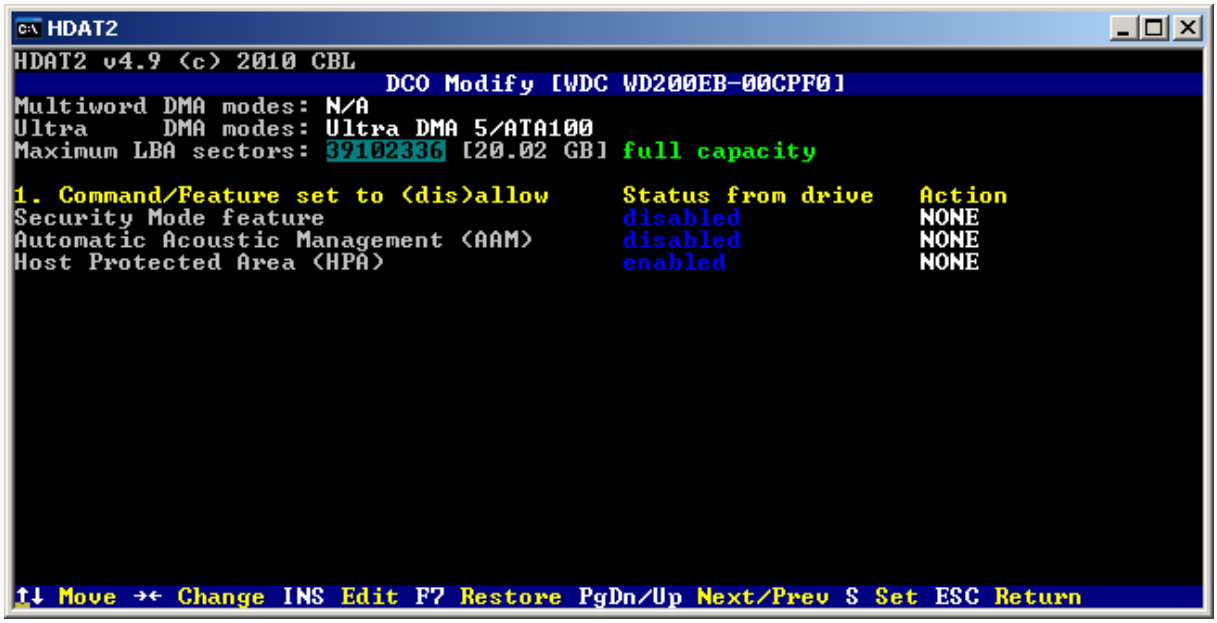
Example: We will try to create DCO area with a size of 50 sectors (25 KB) when device has a HPA area already.

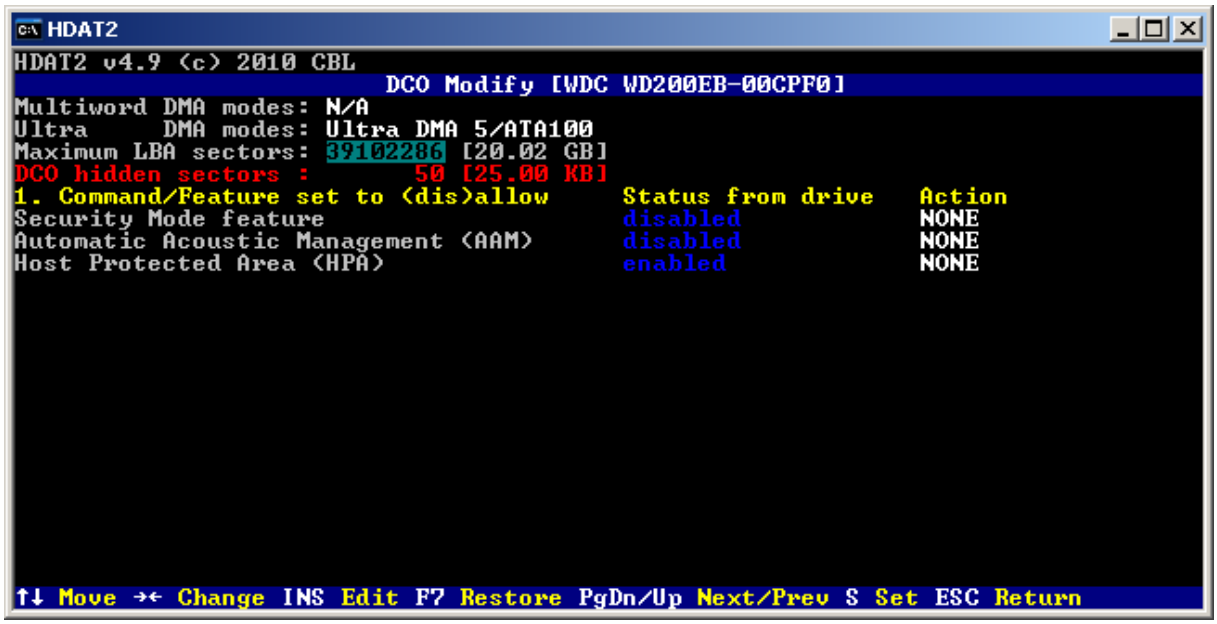

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type Nr. Device name BIOS LBA Capacity
PATA 1! WDC WD200EB-00CPF0 82h 28 20.02 GB
PATAPI 2 HL-DT-ST DVDRAM GSA-4163B 32
Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE
↑↓ Move D Detect P Params ENTER Menu ESC Exit

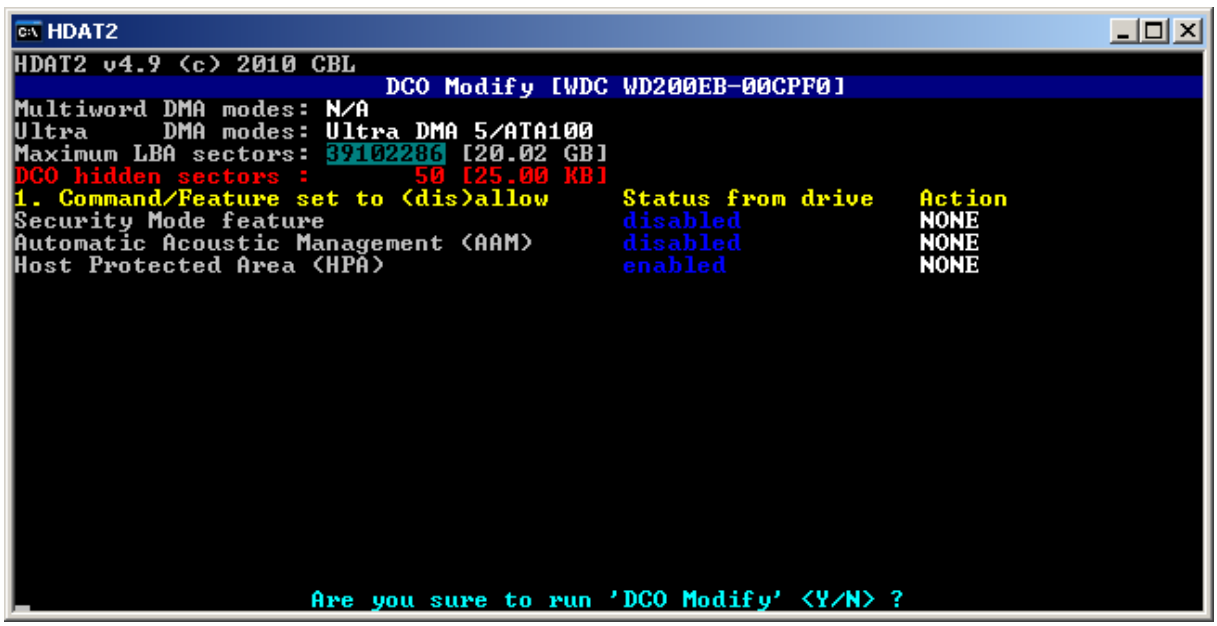


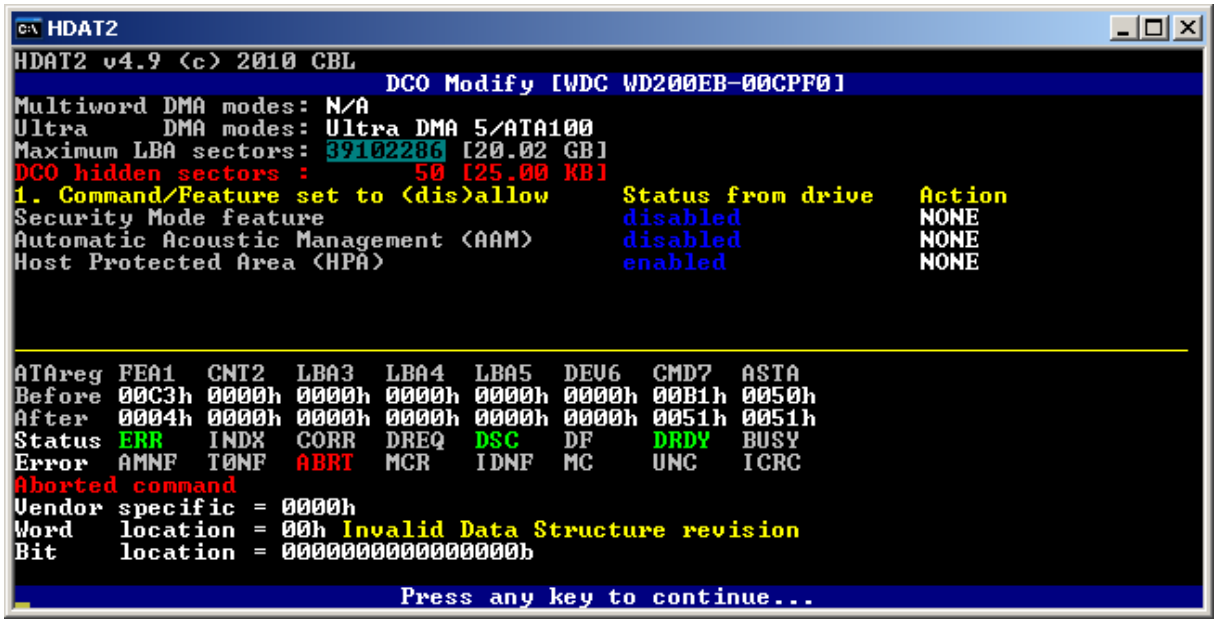

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]
Show Identify
Modify
Restore
Freeze Lock
Check DCO structure
Dump DCO Data
DCO area : disabled
DCO frozen: disabled
Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.
To create or remove DCO area you must first remove an active HPA area.
↑↓ Move ENTER Run ESC Return

Here you get a warning message about active HPA area. See an error message later.


HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102336 [20.02 GB] full capacity
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

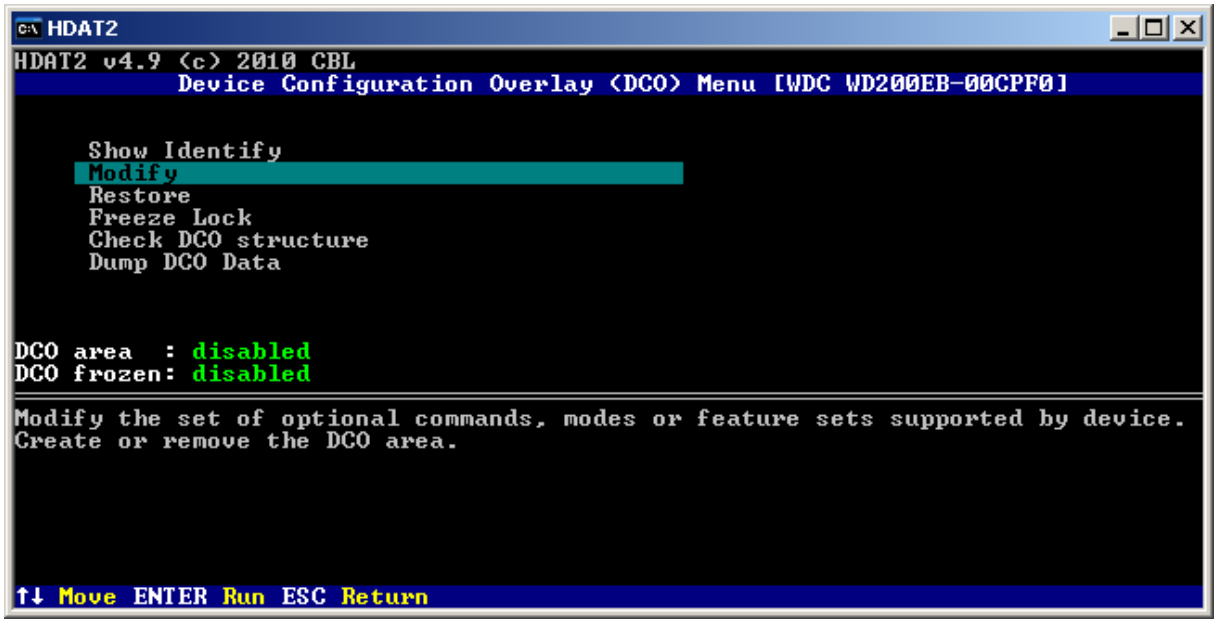

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

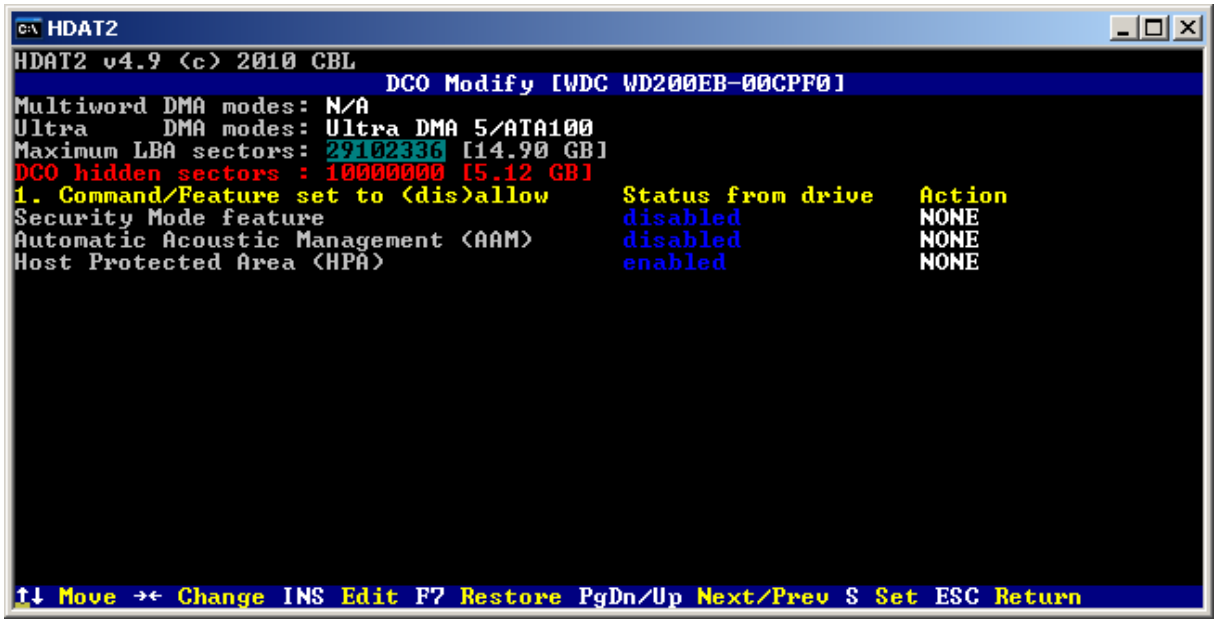

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
Are you sure to run 'DCO Modify' <Y/N> ?

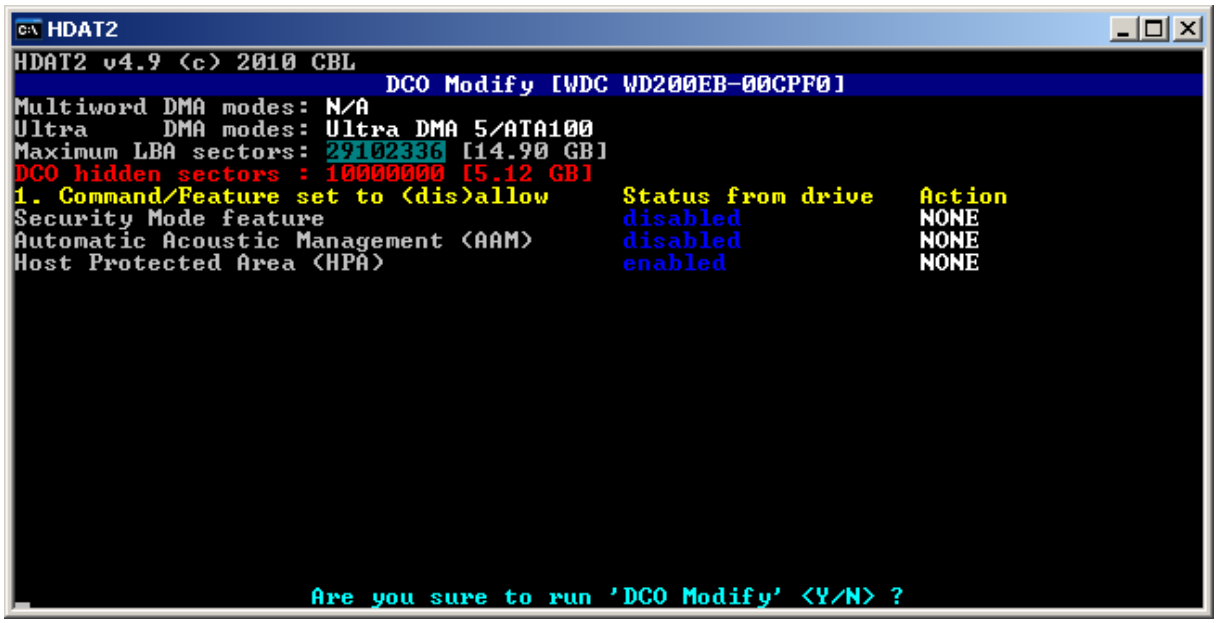

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 39102286 [20.02 GB]
DCO hidden sectors : 50 [25.00 KB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 00C3h 0000h 0000h 0000h 0000h 0000h 00B1h 0050h
After 0004h 0000h 0000h 0000h 0000h 0000h 0051h 0051h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT MCR IDNF MC UNC ICRC
Aborted command
Vendor specific = 0000h
Word location = 00h Invalid Data Structure revision
Bit location = 0000000000000000b
Press any key to continue...

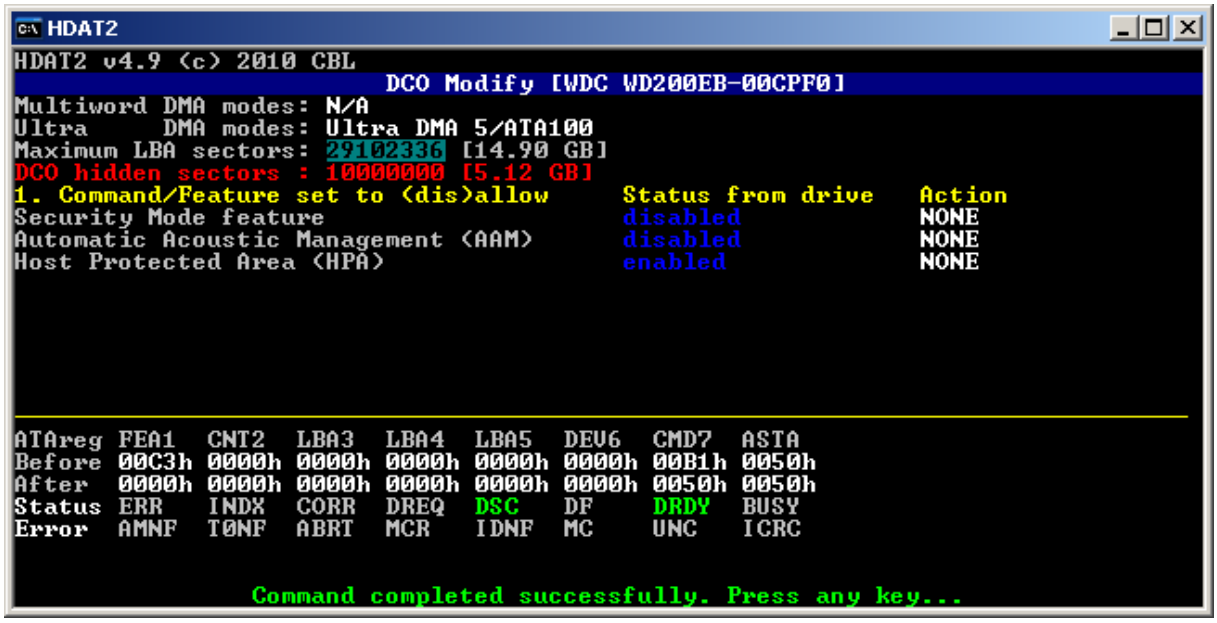
We got an error message, because we was trying to create DCO area but there was HPA area already. We must first remove an active HPA area before creating DCO area.

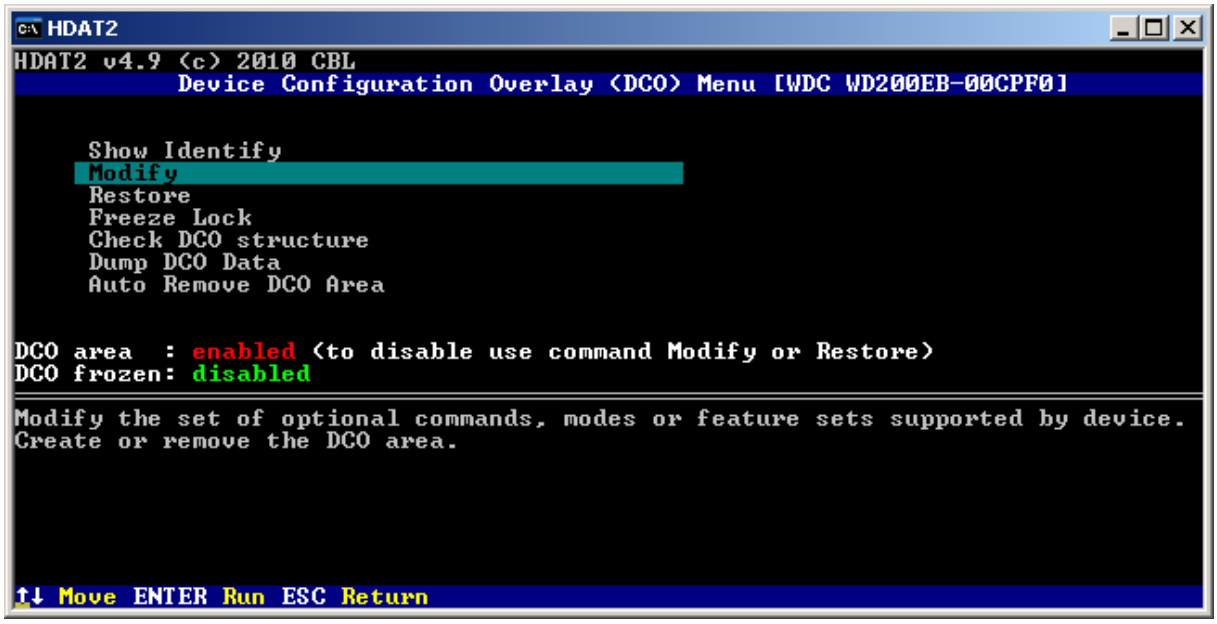
Example: Now we create DCO area with a size 10,000,000 sectors (about 5 GB) without HPA area.


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]
Show Identify
Modify
Restore
Freeze Lock
Check DCO structure
Dump DCO Data
DCO area : disabled
DCO frozen: disabled
Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.
↑↓ Move ENTER Run ESC Return

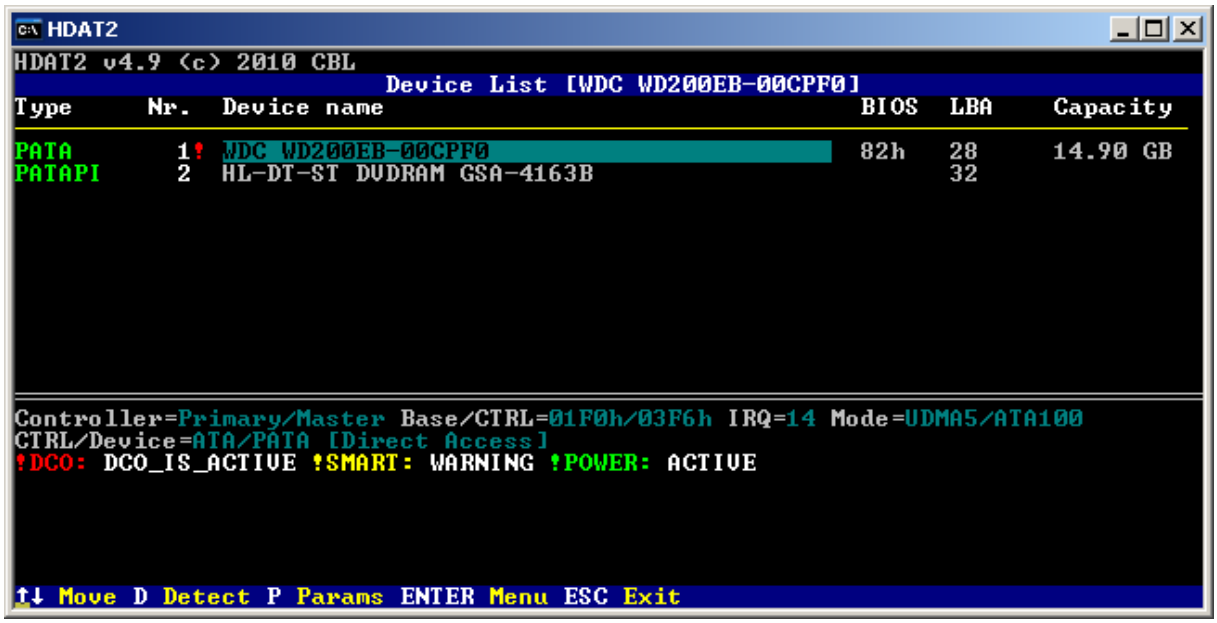

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
↑↓ Move →← Change INS Edit F7 Restore PgDn/Up Next/Prev S Set ESC Return

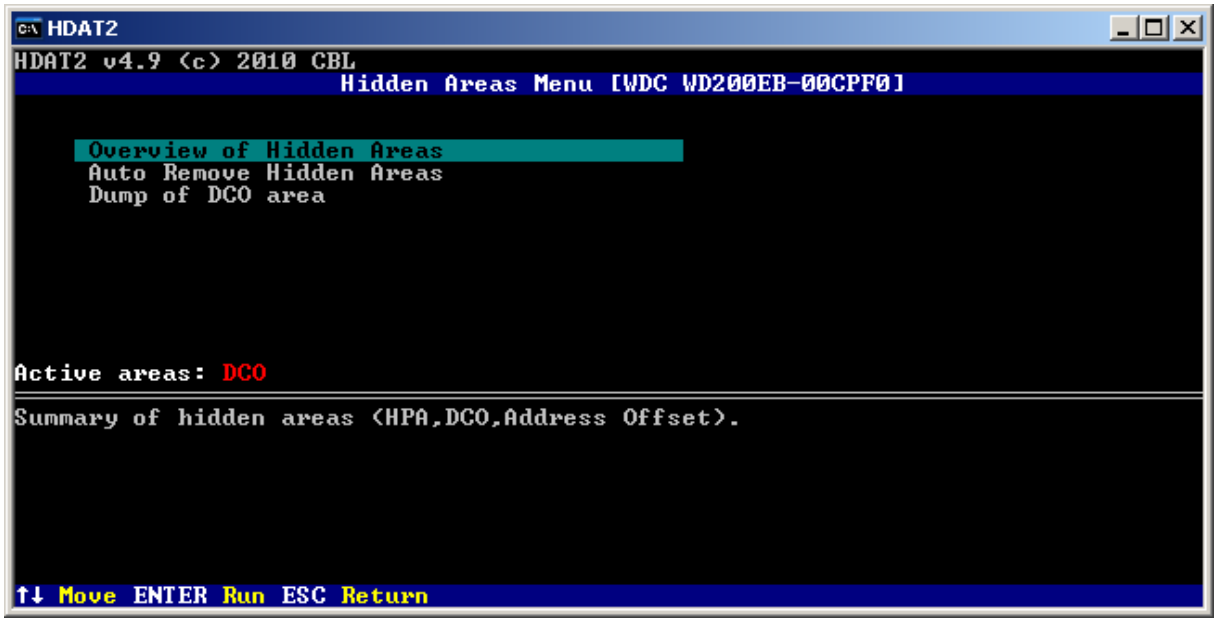

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
Are you sure to run 'DCO Modify' (Y/N) ?

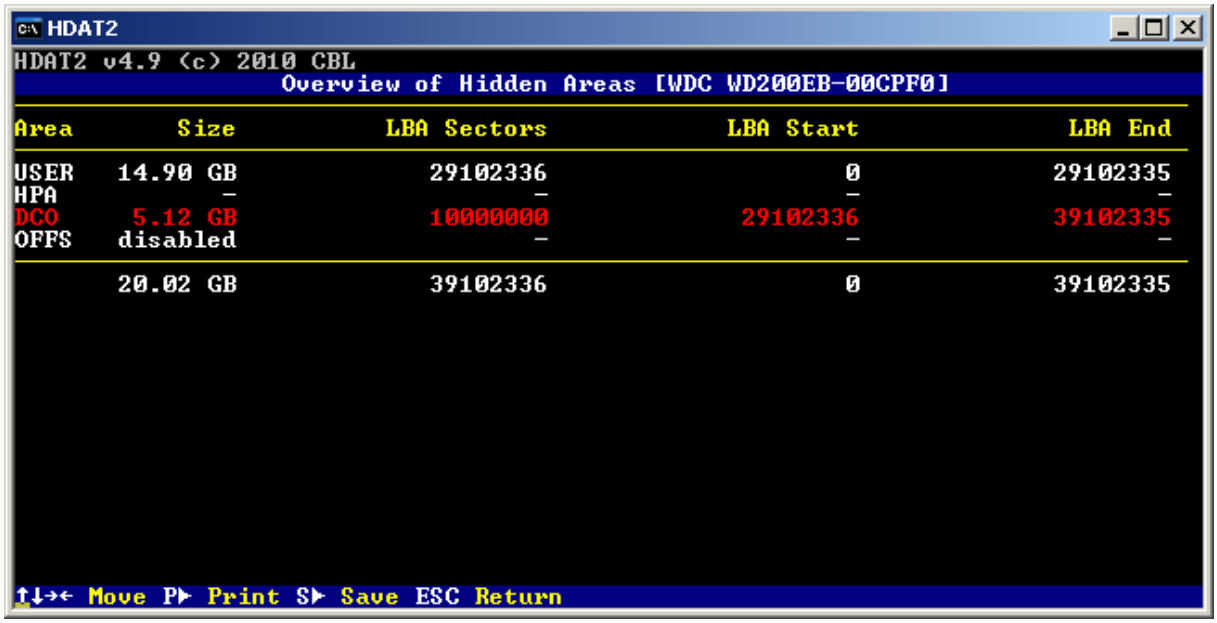

HDAT2
HDAT2 v4.9 (c) 2010 CBL
DCO Modify [WDC WD200EB-00CPF0]
Multiword DMA modes: N/A
Ultra DMA modes: Ultra DMA 5/ATA100
Maximum LBA sectors: 29102336 [14.90 GB]
DCO hidden sectors : 10000000 [5.12 GB]
1. Command/Feature set to (dis)allow
Status from drive
Action
Security Mode feature
disabled
NONE
Automatic Acoustic Management (AAM)
disabled
NONE
Host Protected Area (HPA)
enabled
NONE
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 00C3h 0000h 0000h 0000h 0000h 0000h 00B1h 0050h
After 0000h 0000h 0000h 0000h 0000h 0000h 0050h 0050h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT MCR IDNF MC UNC ICRC
Command completed successfully. Press any key...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device Configuration Overlay (DCO) Menu [WDC WD200EB-00CPF0]
Show Identify
Modify
Restore
Freeze Lock
Check DCO structure
Dump DCO Data
Auto Remove DCO Area
DCO area : enabled (to disable use command Modify or Restore)
DCO frozen: disabled
Modify the set of optional commands, modes or feature sets supported by device.
Create or remove the DCO area.
↑↓ Move ENTER Run ESC Return

DCO area is enabled now.


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type Nr. Device name BIOS LBA Capacity
PATA 1! WDC WD200EB-00CPF0 82h 28 14.90 GB
PATAPI 2 HL-DT-ST DVDRAM GSA-4163B 32
Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!DCO: DCO_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE
↑↓ Move D Detect P Params ENTER Menu ESC Exit


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]
Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of DCO area
Active areas: DCO
Summary of hidden areas (HPA,DCO,Address Offset).
↑↓ Move ENTER Run ESC Return

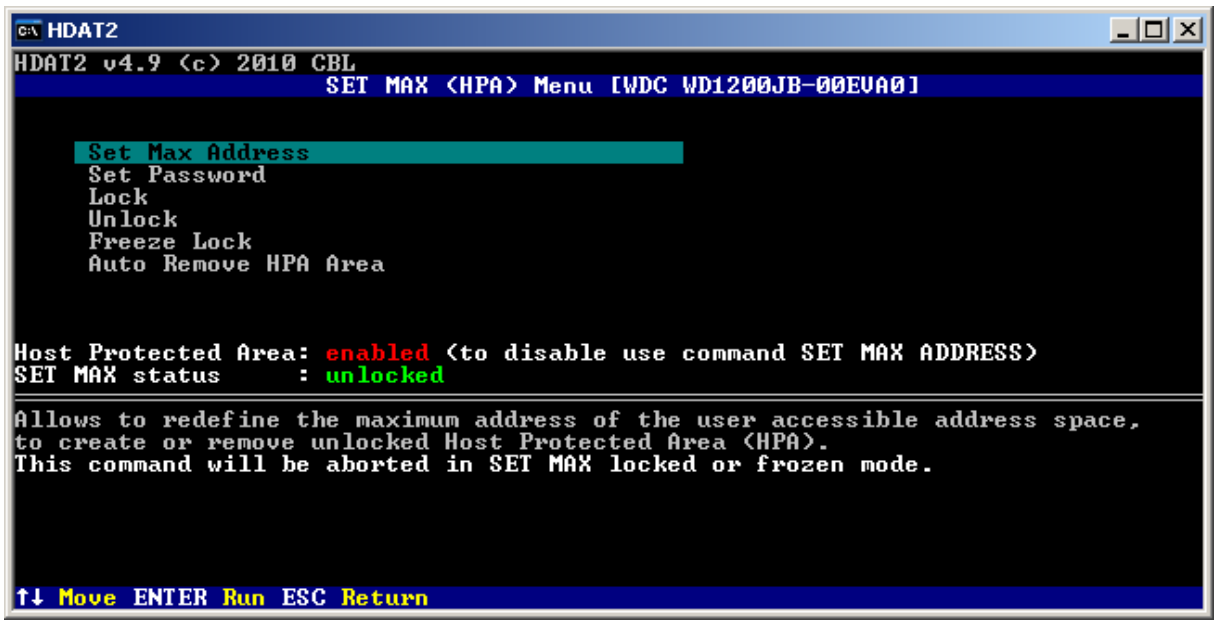

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD200EB-00CPF0]
Area Size LBA Sectors LBA Start LBA End
USER 14.90 GB 29102336 0 29102335
HPA - - - -
DCO 5.12 GB 10000000 29102336 39102335
OFFS disabled - - -
20.02 GB 39102336 0 39102335
↑↓→← Move P▶ Print S▶ Save ESC Return

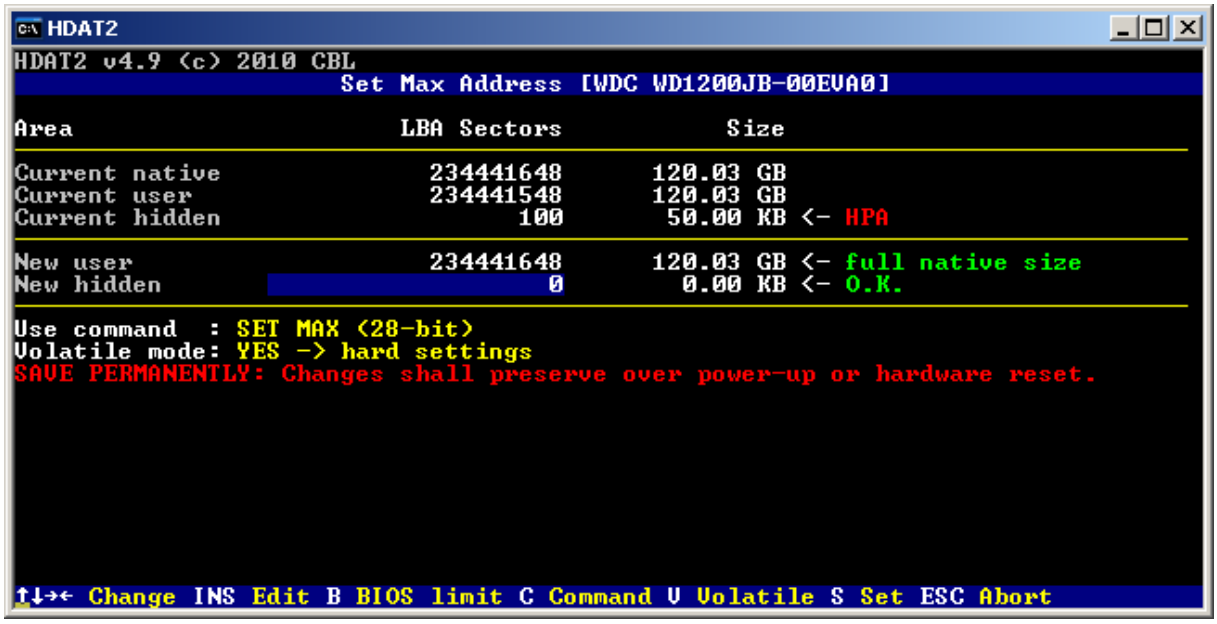
Remove hidden area HPA

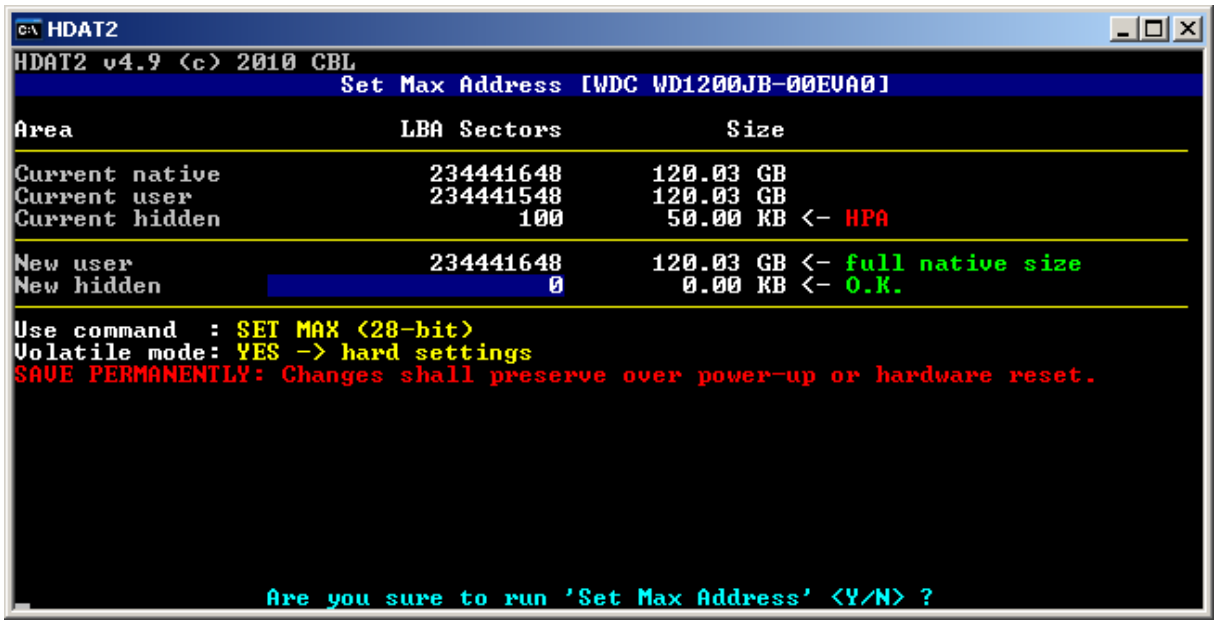
To remove HPA area you can use SET MAX ADDRESS command or menu option Auto Remove Hidden Areas.

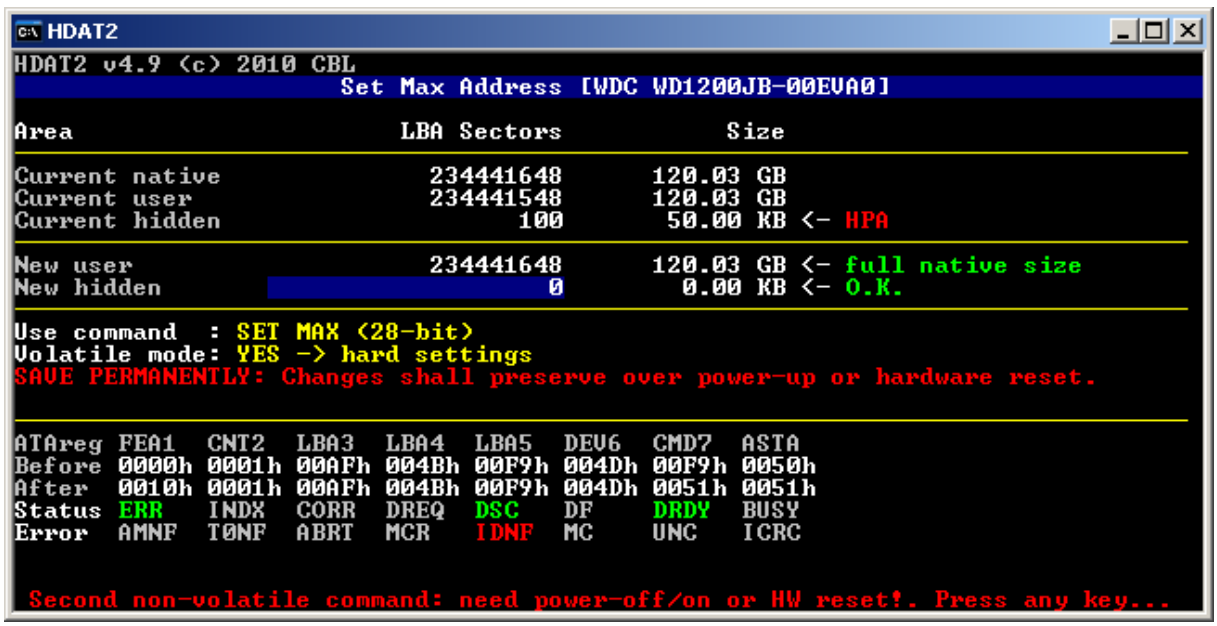
Remove hidden area HPA with SET MAX ADDRESS

Example: We try to remove created HPA of 100 sectors. We use 28-bit SET MAX ADDRESS command.

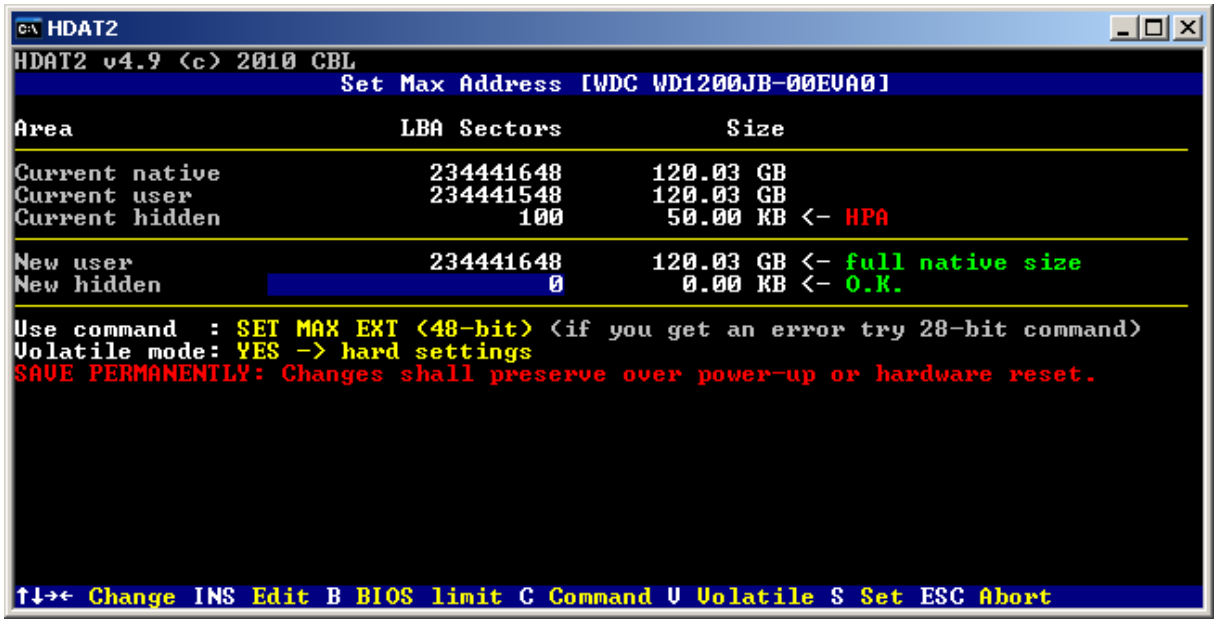

HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX (HPA) Menu [WDC WD1200JB-00EVA0]
Set Max Address
Set Password
Lock
Unlock
Freeze Lock
Auto Remove HPA Area
Host Protected Area: enabled (to disable use command SET MAX ADDRESS)
SET MAX status : unlocked
Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.
↑↓ Move ENTER Run ESC Return

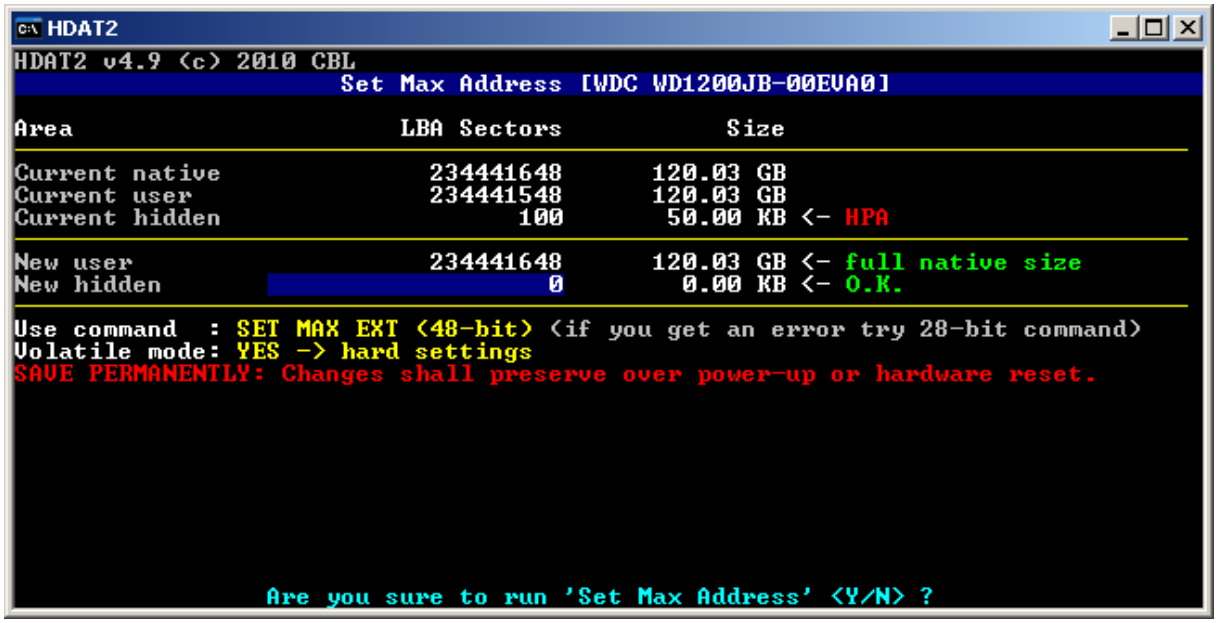

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441548 120.03 GB
Current hidden 100 50.00 KB <- HPA
New user 234441648 120.03 GB <- full native size
New hidden 0 0.00 KB <- O.K.
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
↑↓→← Change INS Edit B BIOS limit C Command V Volatile S Set ESC Abort

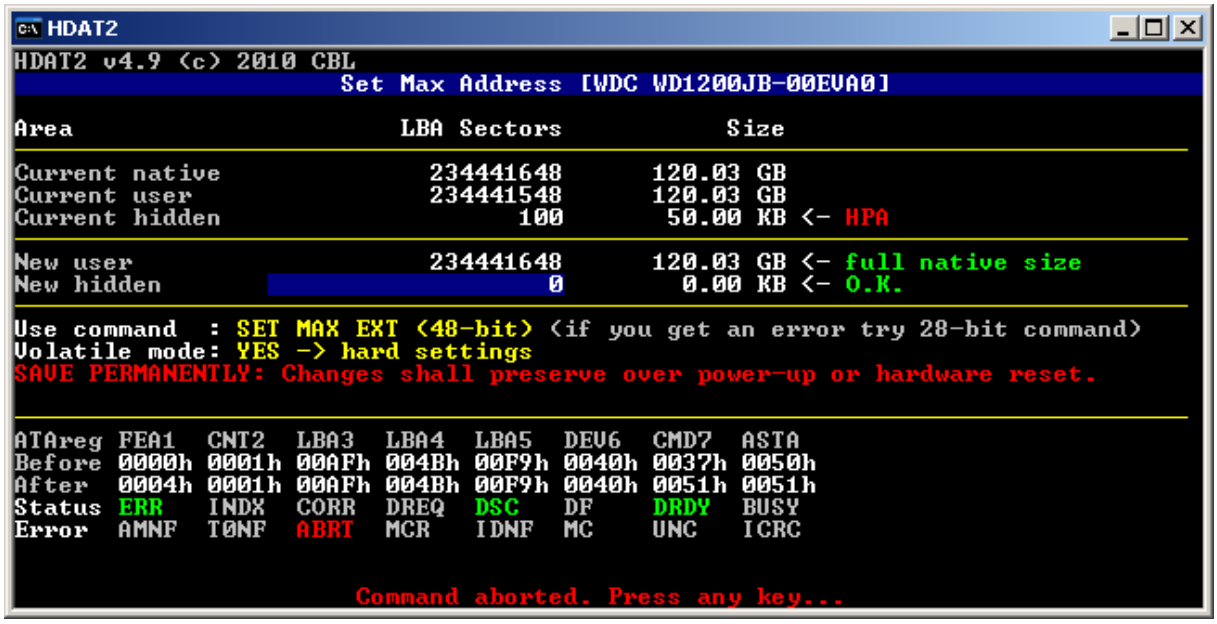

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441548 120.03 GB
Current hidden 100 50.00 KB <- HPA
New user 234441648 120.03 GB <- full native size
New hidden 0 0.00 KB <- O.K.
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
Are you sure to run 'Set Max Address' <Y/N> ?


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441548 120.03 GB
Current hidden 100 50.00 KB <- HPA
New user 234441648 120.03 GB <- full native size
New hidden 0 0.00 KB <- O.K.
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 0000h 0001h 00AFh 004Bh 00F9h 004Dh 00F9h 0050h
After 0010h 0001h 00AFh 004Bh 00F9h 004Dh 0051h 0051h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT MCR IDNF MC UNC ICRC
Second non-volatile command: need power-off/on or HW reset!. Press any key...

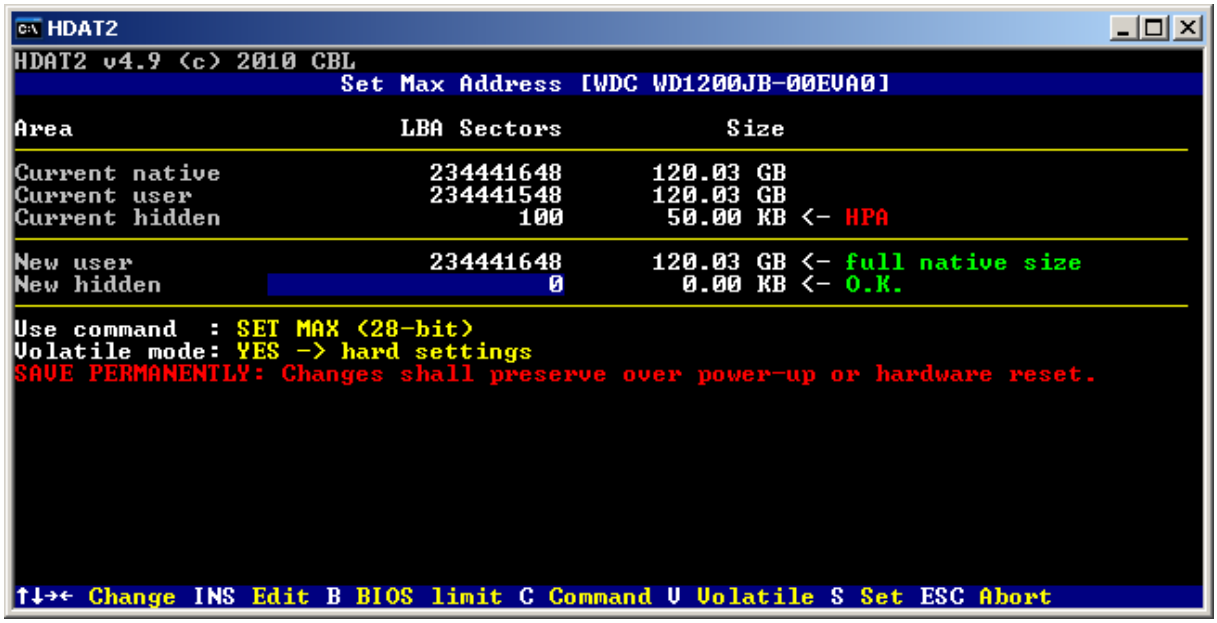
This error message you will see if you try to call the second non-volatile command without power off (e.g. immediately after creating). So we turn power off and on and try it again, but with 48-bit SET MAX command.

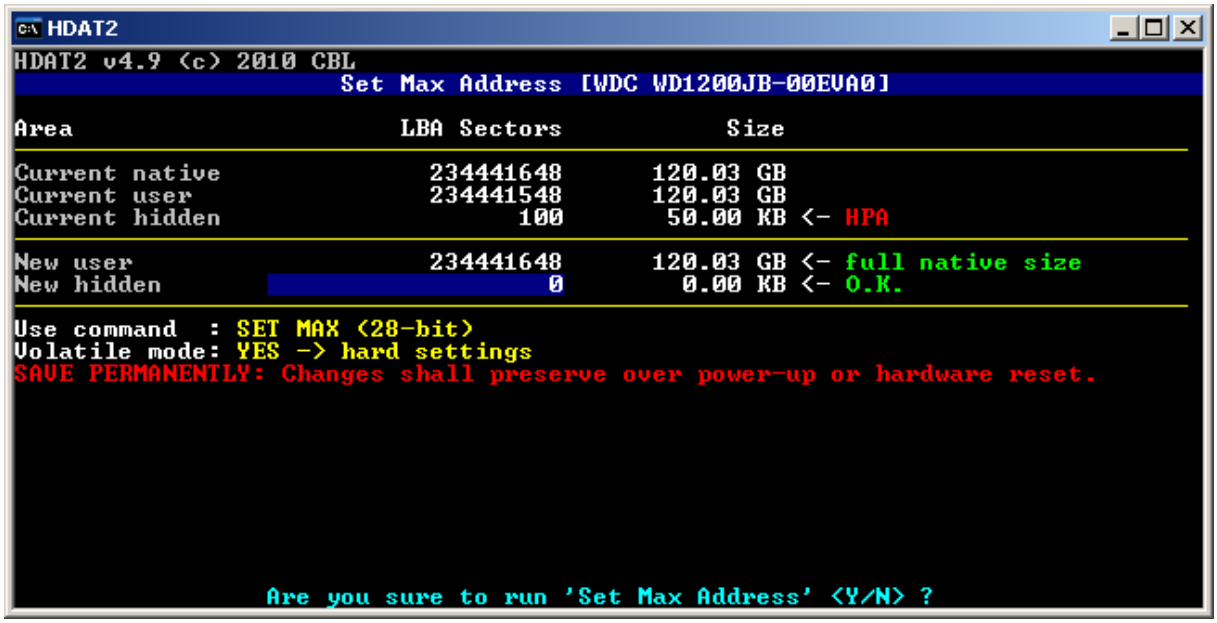


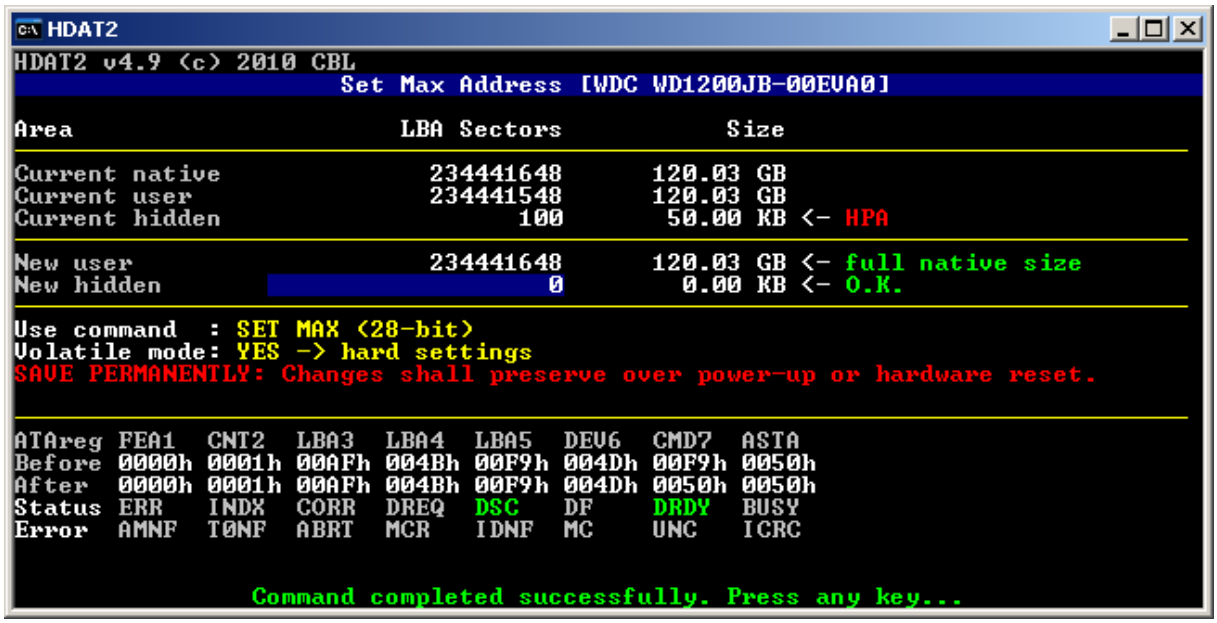


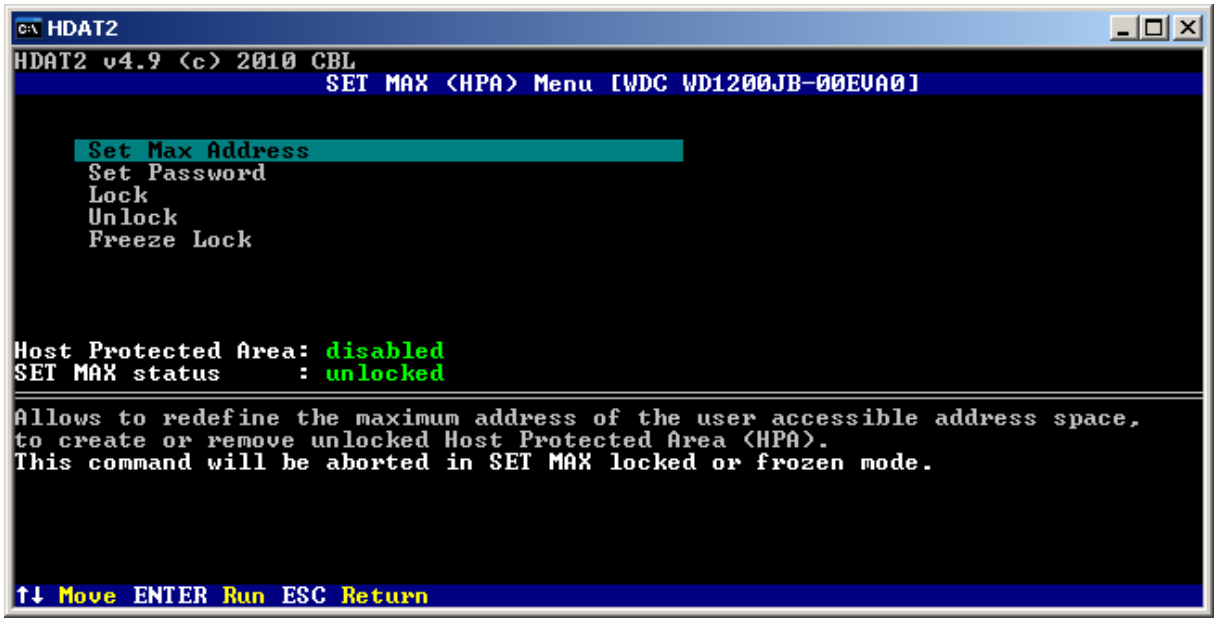


This error message you will see if you try to remove HPA area with 48-bit SET MAX command, but HPA area was created with 28-bit SET MAX command. So we need to select 28-bit SET MAX command.




HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441548 120.03 GB
Current hidden 100 50.00 KB <- HPA
New user 234441648 120.03 GB <- full native size
New hidden 0 0.00 KB <- O.K.
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
Are you sure to run 'Set Max Address' <Y/N> ?


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Max Address [WDC WD1200JB-00EVA0]
Area LBA Sectors Size
Current native 234441648 120.03 GB
Current user 234441548 120.03 GB
Current hidden 100 50.00 KB <- HPA
New user 234441648 120.03 GB <- full native size
New hidden 0 0.00 KB <- O.K.
Use command : SET MAX (28-bit)
Volatile mode: YES -> hard settings
SAVE PERMANENTLY: Changes shall preserve over power-up or hardware reset.
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 0000h 0001h 00AFh 004Bh 00F9h 004Dh 00F9h 0050h
After 0000h 0001h 00AFh 004Bh 00F9h 004Dh 0050h 0050h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT MCR IDNF MC UNC ICRC
Command completed successfully. Press any key...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
SET MAX (HPA) Menu [WDC WD1200JB-00EVA0]
Set Max Address
Set Password
Lock
Unlock
Freeze Lock
Host Protected Area: disabled
SET MAX status : unlocked
Allows to redefine the maximum address of the user accessible address space,
to create or remove unlocked Host Protected Area (HPA).
This command will be aborted in SET MAX locked or frozen mode.
↑↓ Move ENTER Run ESC Return

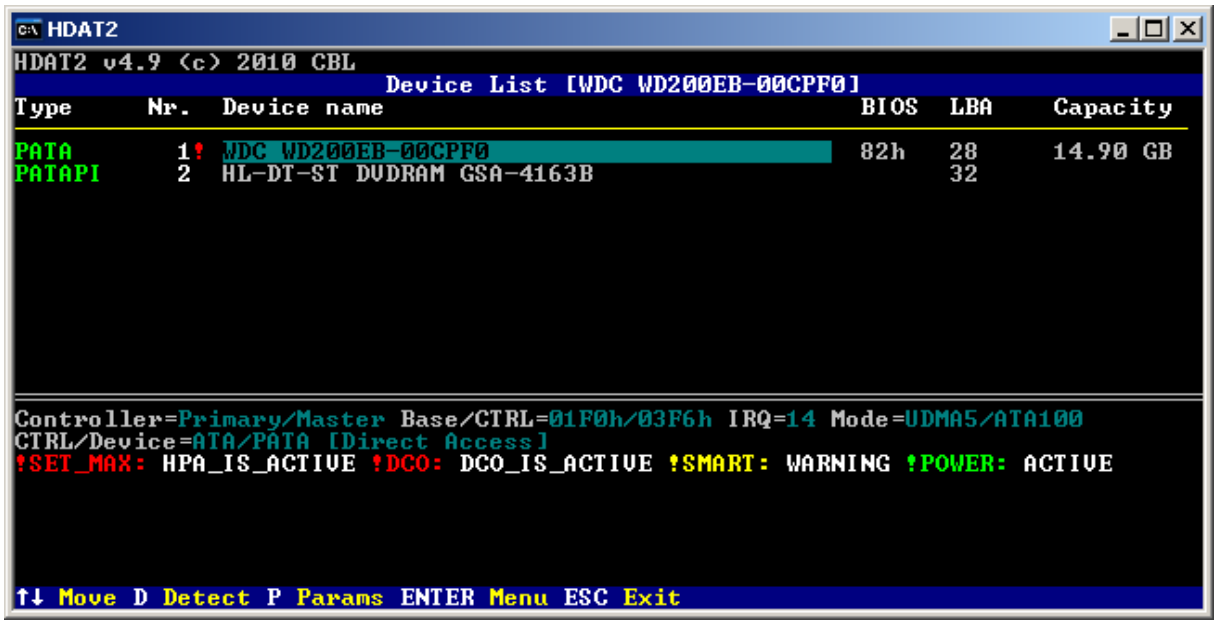
Now is the HPA area removed.

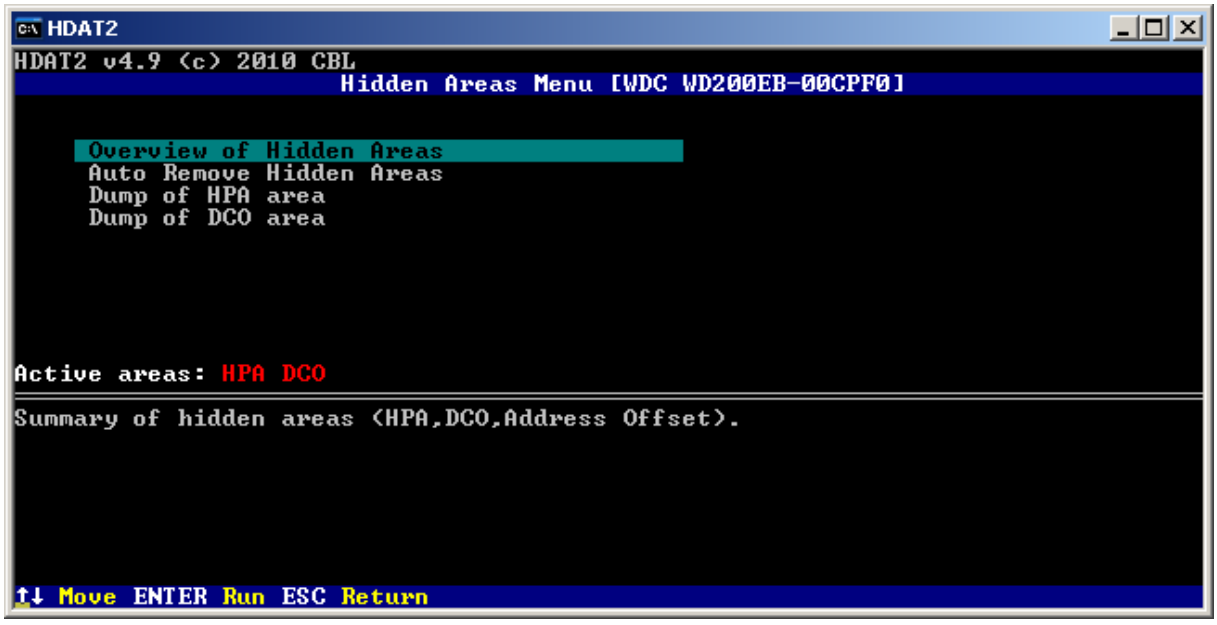
Remove hidden area DCO

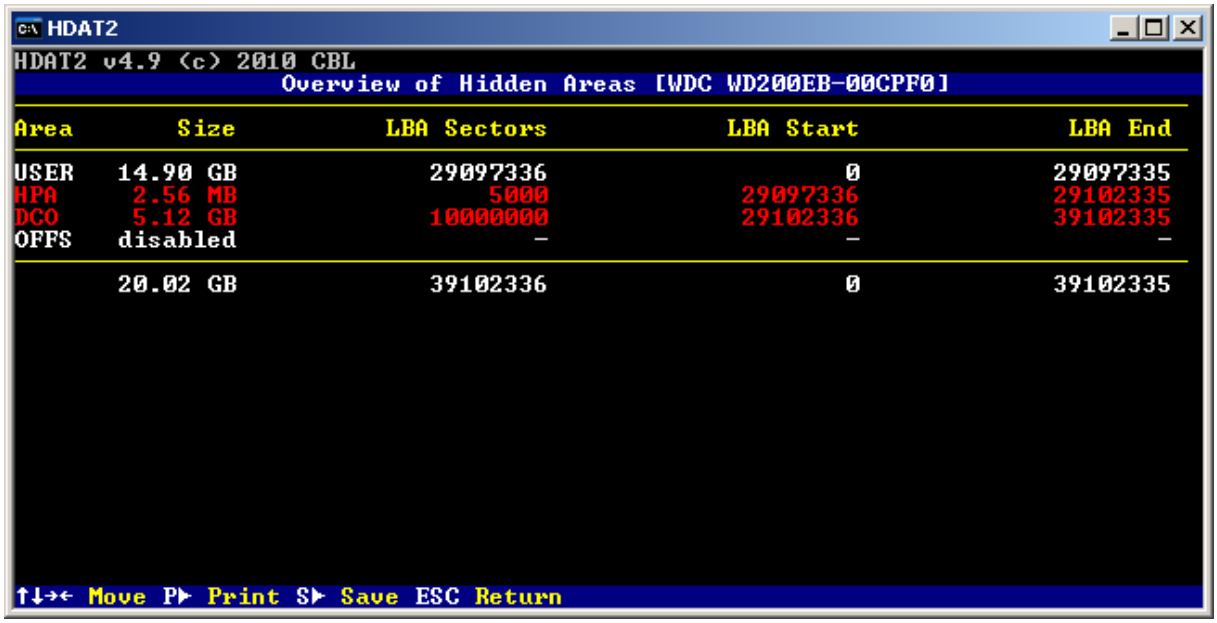
To remove DCO area you can use DCO MODIFY command or menu option Auto Remove Hidden Areas.

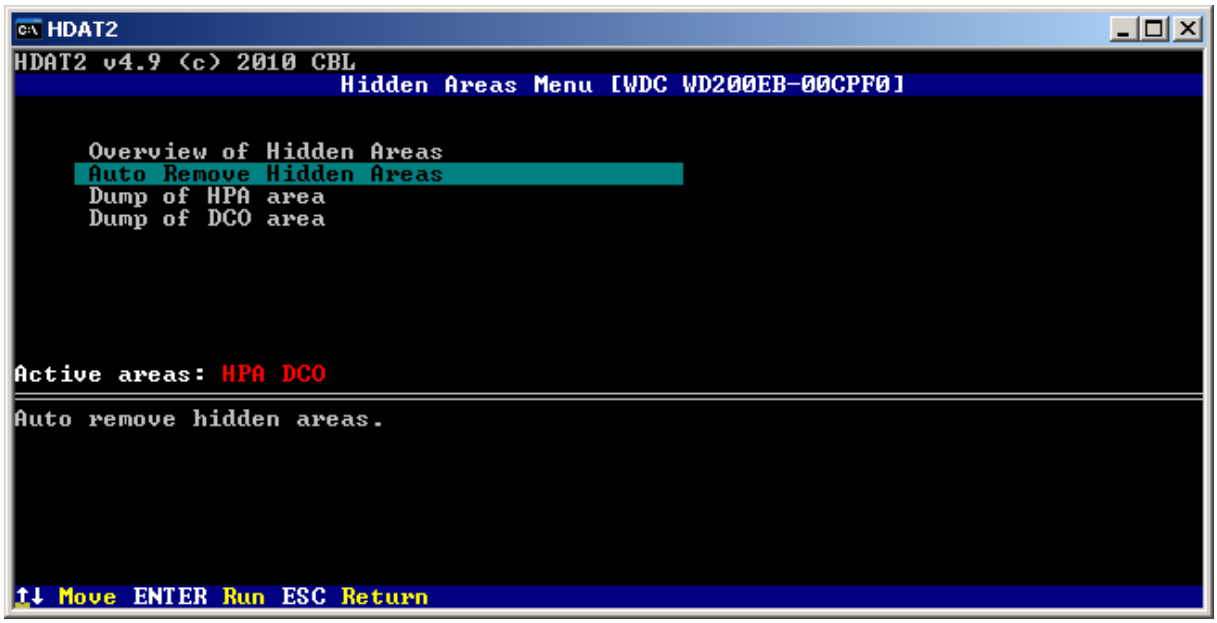
Auto Remove hidden areas

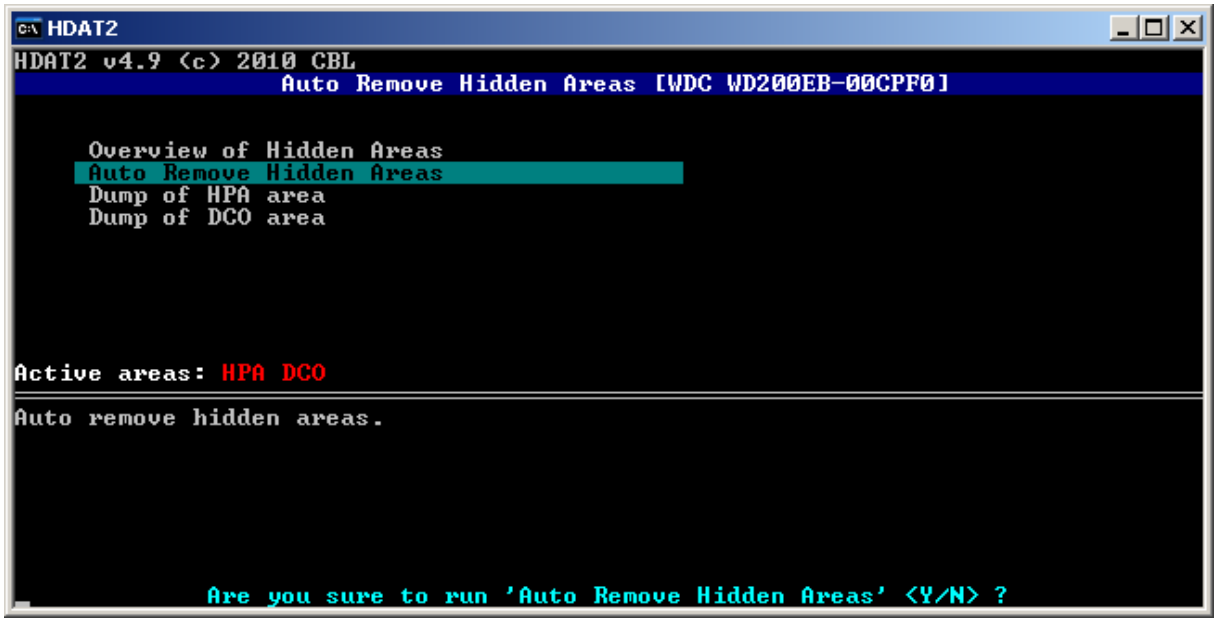
Example: We try to remove any created HPA and DCO areas. We use auto remove option.

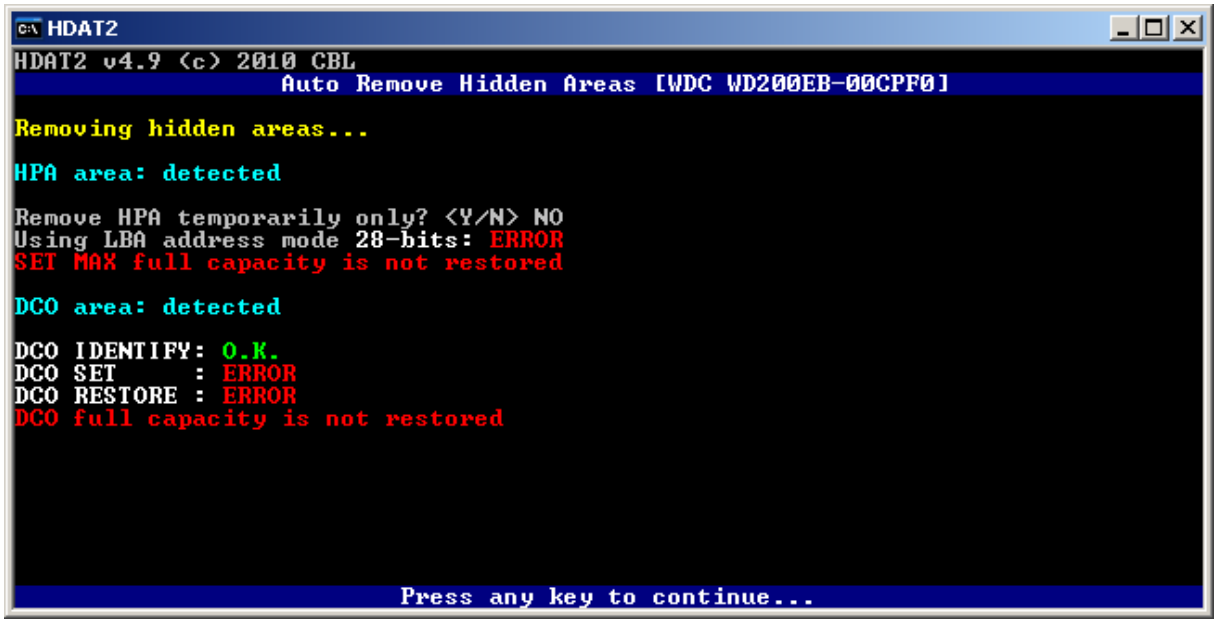

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Device List [WDC WD200EB-00CPF0]
Type Nr. Device name BIOS LBA Capacity
PATA 1! WDC WD200EB-00CPF0 82h 28 14.90 GB
PATAPI 2 HL-DT-ST DVDRAM GSA-4163B 32
Controller=Primary/Master Base/CTRL=01F0h/03F6h IRQ=14 Mode=UDMA5/ATA100
CTRL/Device=ATA/PATA [Direct Access]
!SET_MAX: HPA_IS_ACTIVE !DCO: DCO_IS_ACTIVE !SMART: WARNING !POWER: ACTIVE
↑↓ Move D Detect P Params ENTER Menu ESC Exit


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]
Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of HPA area
Dump of DCO area
Active areas: HPA DCO
Summary of hidden areas (HPA,DCO,Address Offset).
↑↓ Move ENTER Run ESC Return

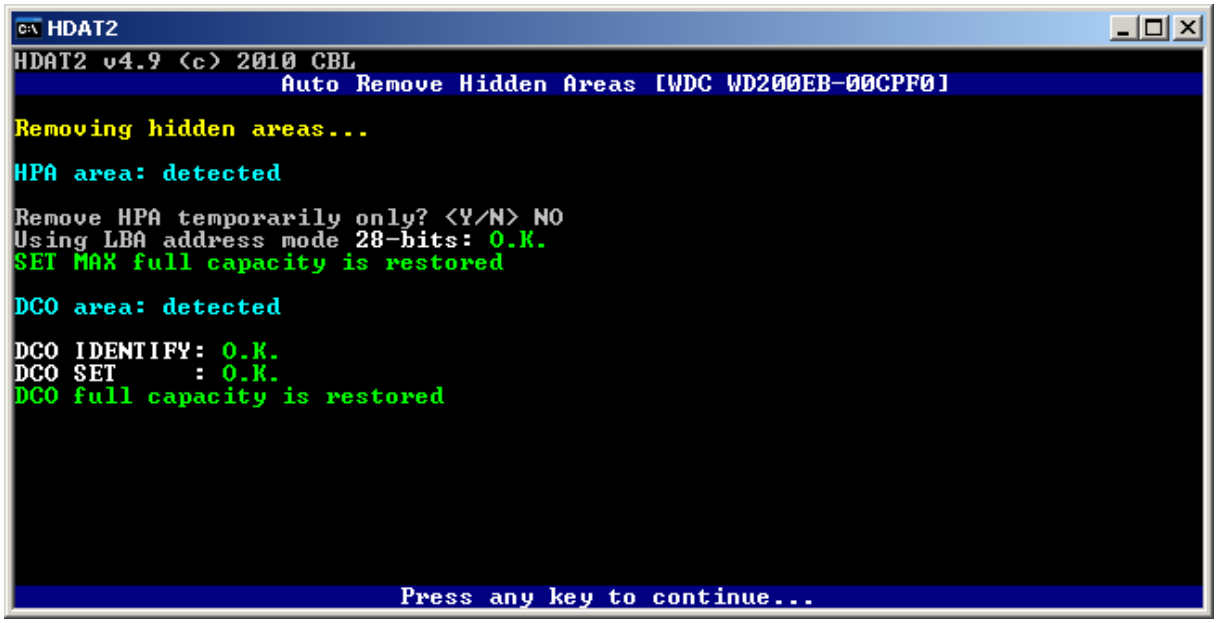

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD200EB-00CPF0]
Area Size LBA Sectors LBA Start LBA End
USER 14.90 GB 29097336 0 29097335
HPA 2.56 MB 5000 29097336 29102335
DCO 5.12 GB 10000000 29102336 39102335
OFFS disabled - - -
20.02 GB 39102336 0 39102335
↑↓→← Move P▶ Print S▶ Save ESC Return

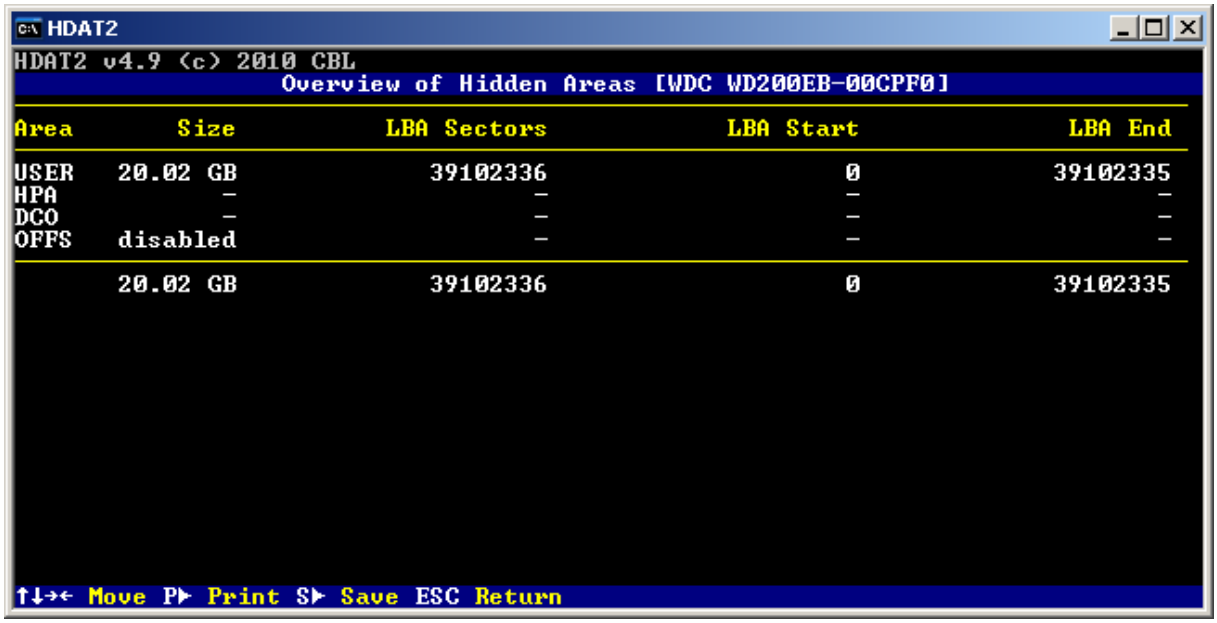

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Hidden Areas Menu [WDC WD200EB-00CPF0]
Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of HPA area
Dump of DCO area
Active areas: HPA DCO
Auto remove hidden areas.
↑↓ Move ENTER Run ESC Return


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]
Overview of Hidden Areas
Auto Remove Hidden Areas
Dump of HPA area
Dump of DCO area
Active areas: HPA DCO
Auto remove hidden areas.
Are you sure to run 'Auto Remove Hidden Areas' <Y/N> ?


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]
Removing hidden areas...
HPA area: detected
Remove HPA temporarily only? <Y/N> NO
Using LBA address mode 28-bits: ERROR
SET MAX full capacity is not restored
DCO area: detected
DCO IDENTIFY: O.K.
DCO SET : ERROR
DCO RESTORE : ERROR
DCO full capacity is not restored
Press any key to continue...

This error message you will see if you try to call the second non-volatile command without power off. So we turned PC off and then turned on and try again.


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Auto Remove Hidden Areas [WDC WD200EB-00CPF0]
Removing hidden areas...
HPA area: detected
Remove HPA temporarily only? <Y/N> NO
Using LBA address mode 28-bits: O.K.
SET MAX full capacity is restored
DCO area: detected
DCO IDENTIFY: O.K.
DCO SET : O.K.
DCO full capacity is restored
Press any key to continue...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Overview of Hidden Areas [WDC WD200EB-00CPF0]
Area Size LBA Sectors LBA Start LBA End
USER 20.02 GB 39102336 0 39102335
HPA - - - -
DCO - - - -
OFFS disabled - - -
20.02 GB 39102336 0 39102335
↑↓→← Move P▶ Print S▶ Save ESC Return

Now are both hidden areas (HPA and DCO) disabled.

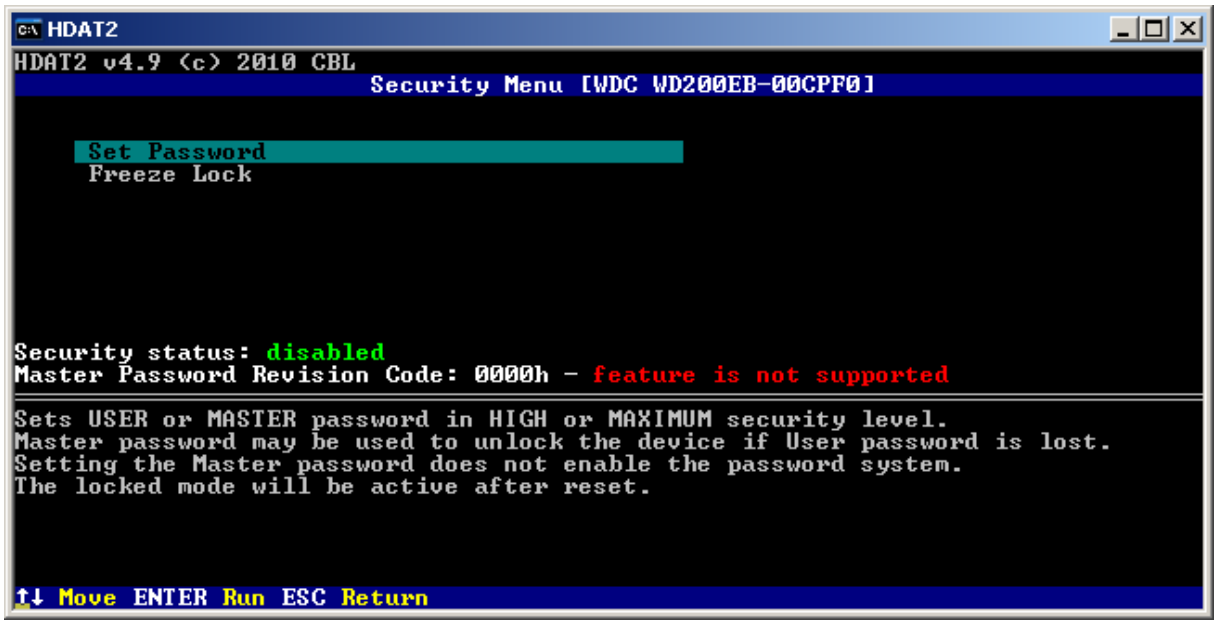
Lock the device

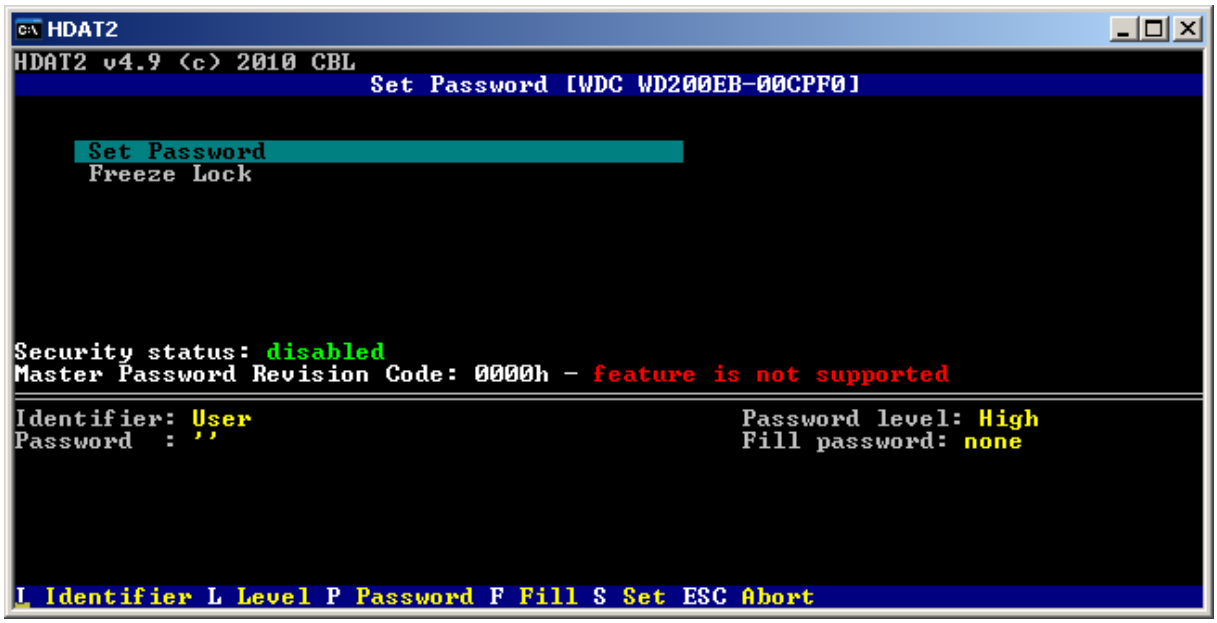
Overview

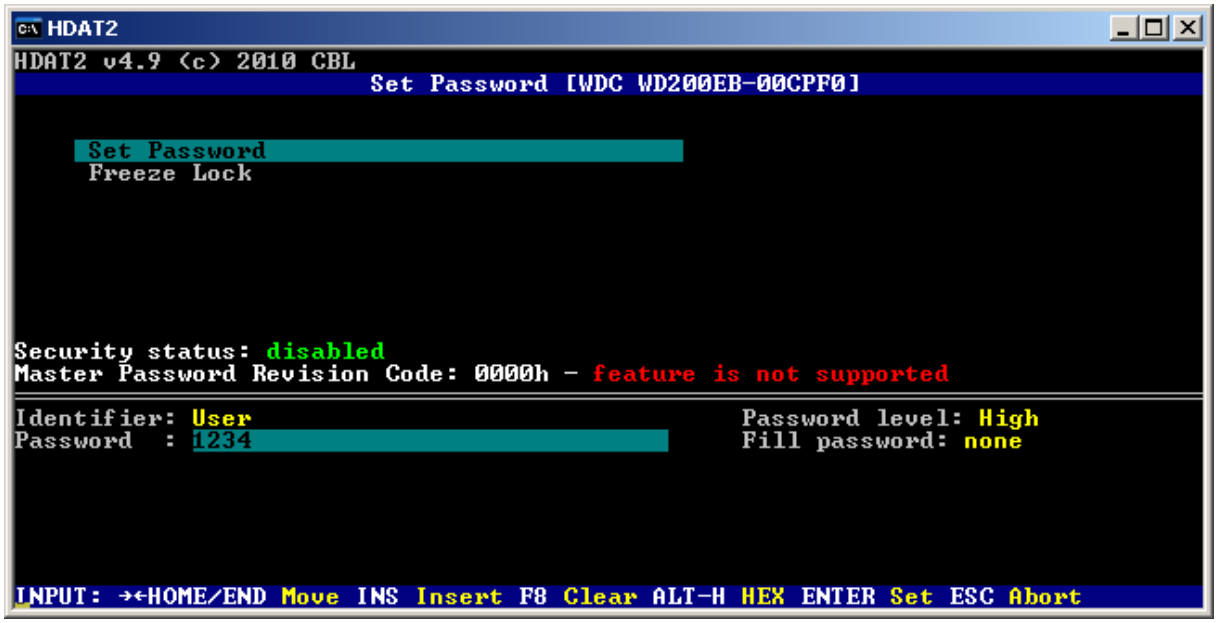
The security system is enabled (the device in a locked state) by sending a user password to the device with the SECURITY SET PASSWORD command. Setting the master password does not enable security system.

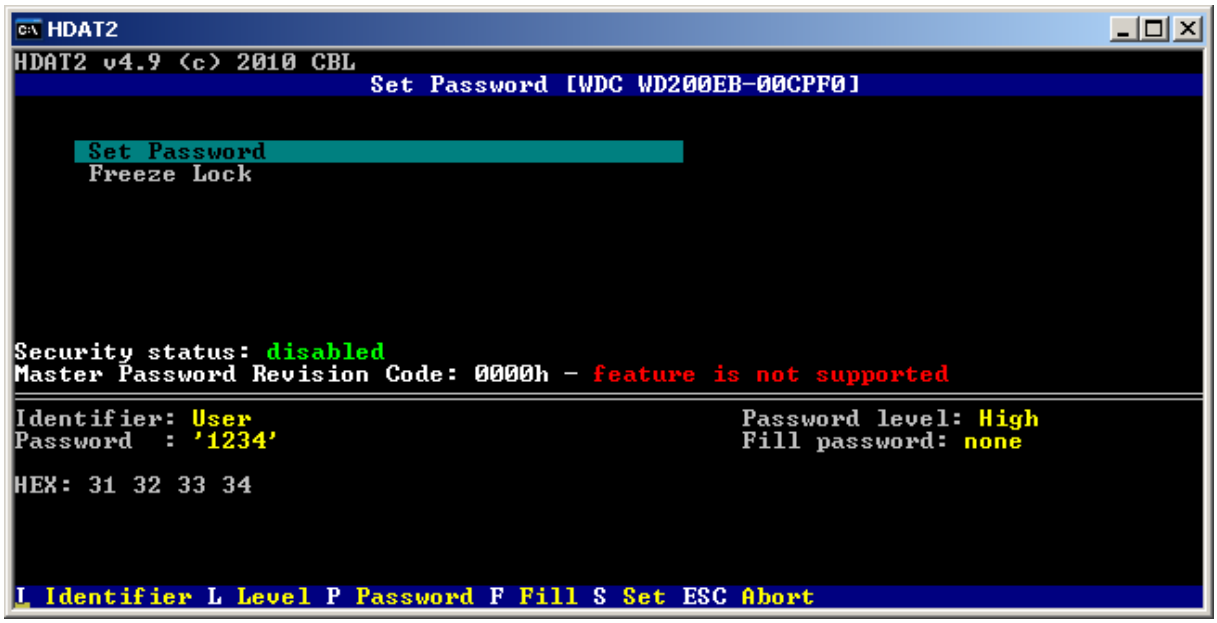
When a user password is set, the drive automatically enters lock mode by the next powered-on. In locked mode, device rejects media access commands until a SECURITY UNLOCK command is successfully completed.

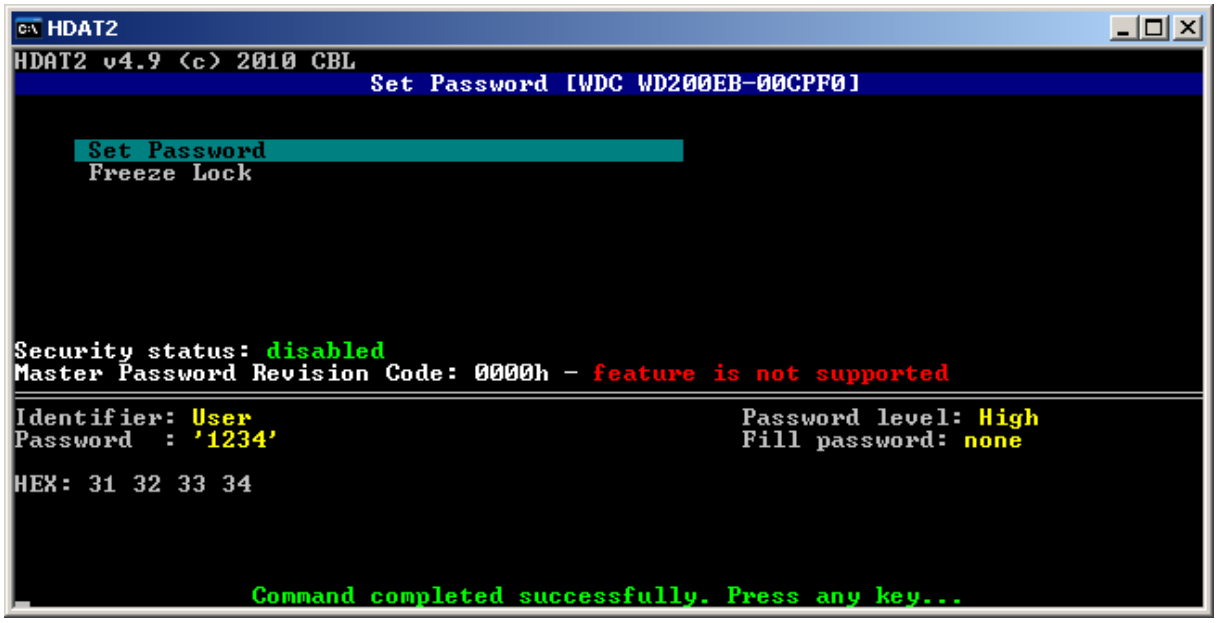
Example: We set the high security mode with the user password "1234".

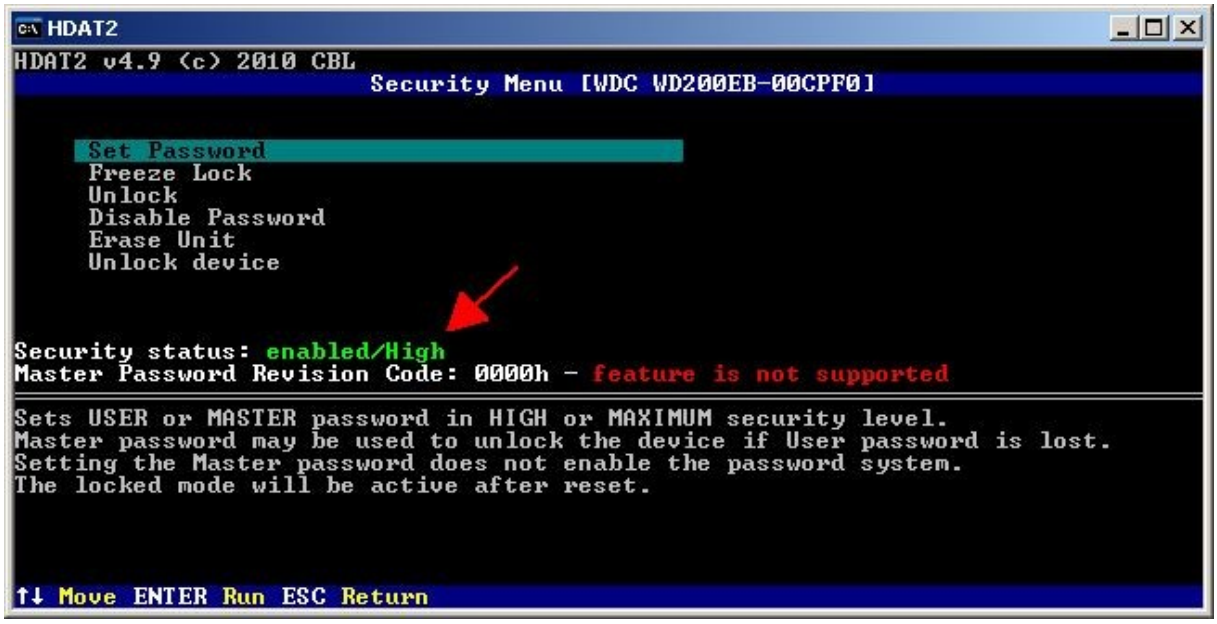

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.
↑↓ Move ENTER Run ESC Return


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : ''
Password level: High
Fill password: none
I Identifier L Level P Password F Fill S Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : 1234
Password level: High
Fill password: none
INPUT: →←HOME/END Move INS Insert F8 Clear ALT-H HEX ENTER Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Password level: High
Fill password: none
HEX: 31 32 33 34
I Identifier L Level P Password F Fill S Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Set Password [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Password level: High
Fill password: none
HEX: 31 32 33 34
Command completed successfully. Press any key...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.
↑↓ Move ENTER Run ESC Return

Unlock the device

Overview

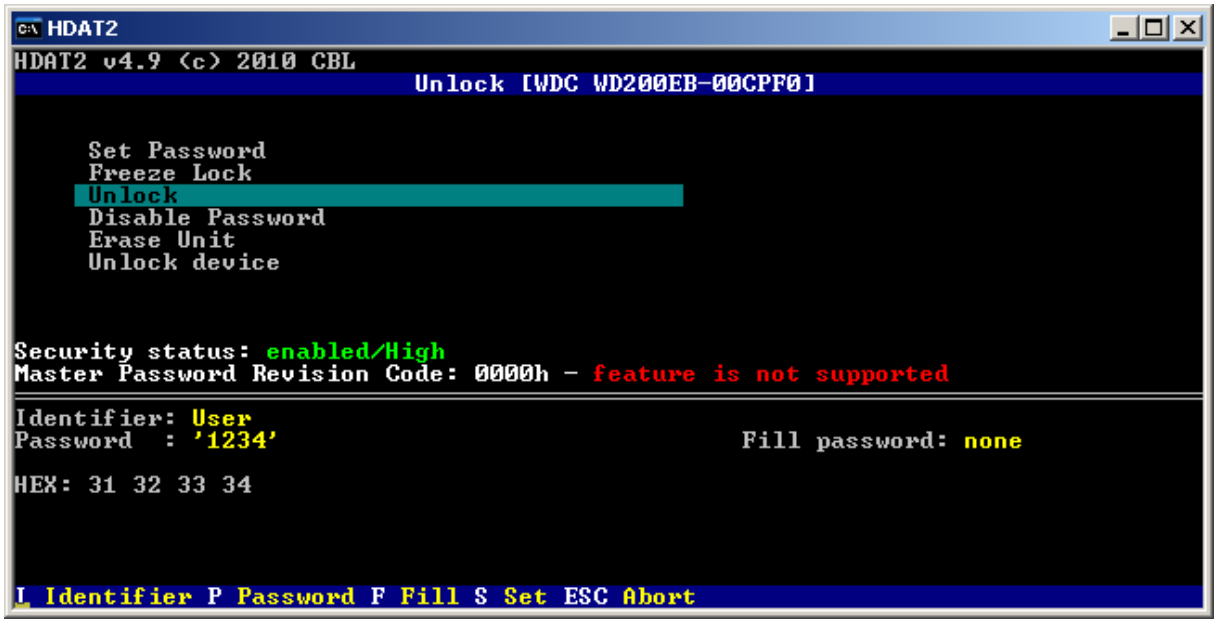
In **High security mode**, the disk can be unlocked with either the User or Master password, using the SECURITY UNLOCK command.

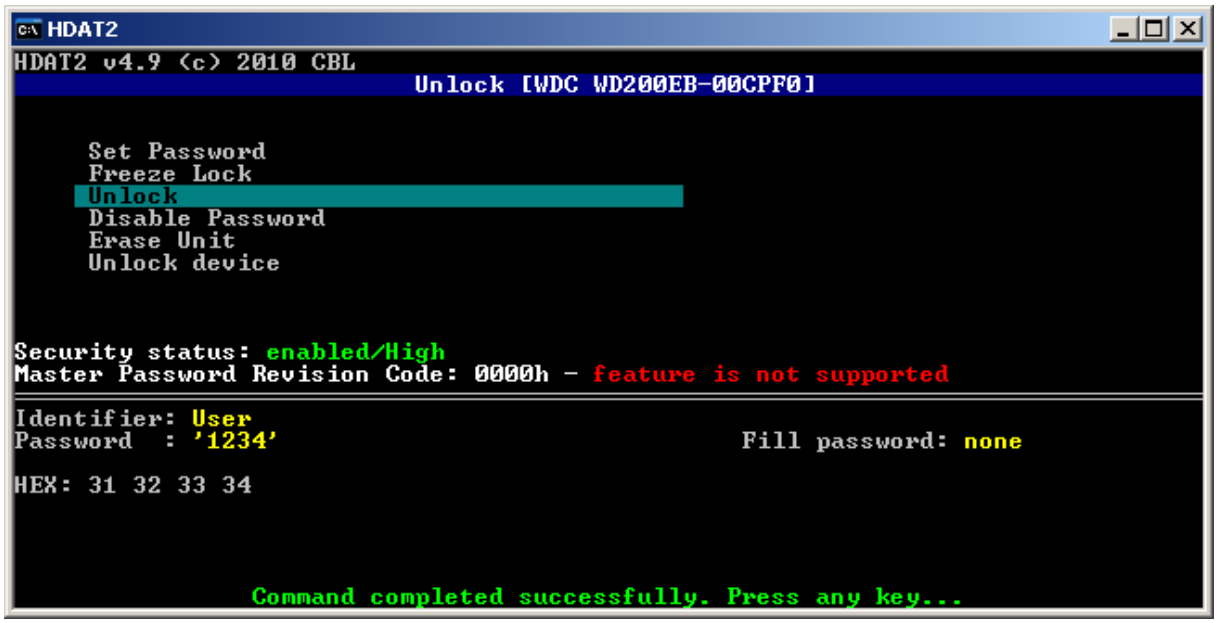
In **Maximum security mode**, the disk can be unlocked with the User password only. Without the User password the device requires a SECURITY ERASE PREPARE command and a SECURITY ERASE UNIT command with the Master password to unlock. Execution of the SECURITY ERASE UNIT command erases all user data on the device. See Security erase the device.

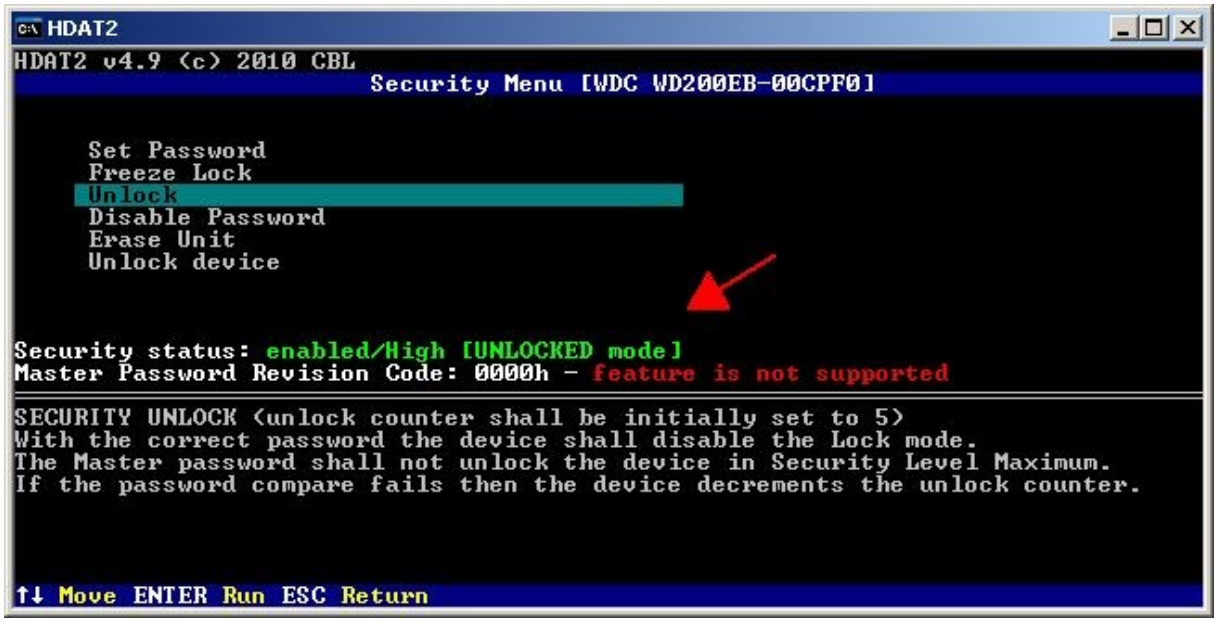
Password lost

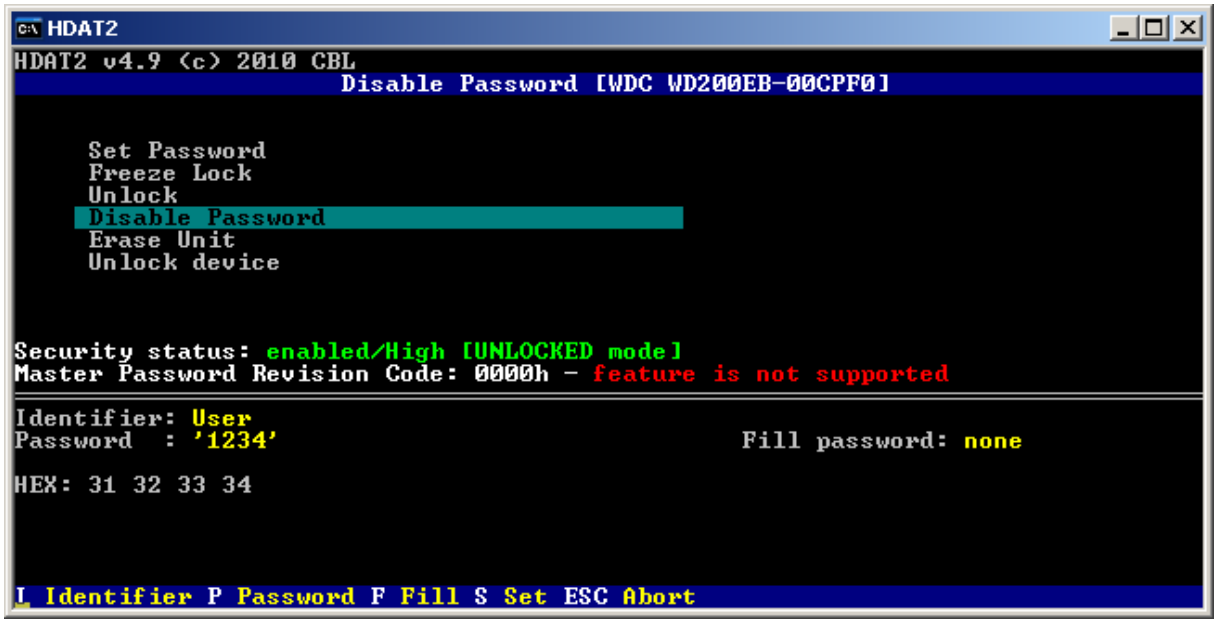
If the user password is lost and High level security is set, the drive does not allow the user to access any data. However, the drive can be unlocked using the master password. If the user password is lost and Maxium security level is set, it is impossible to access data. However, the drive can be unlocked using the ERASE UNIT command with the master password. The drive will erase all user data and unlock the drive.

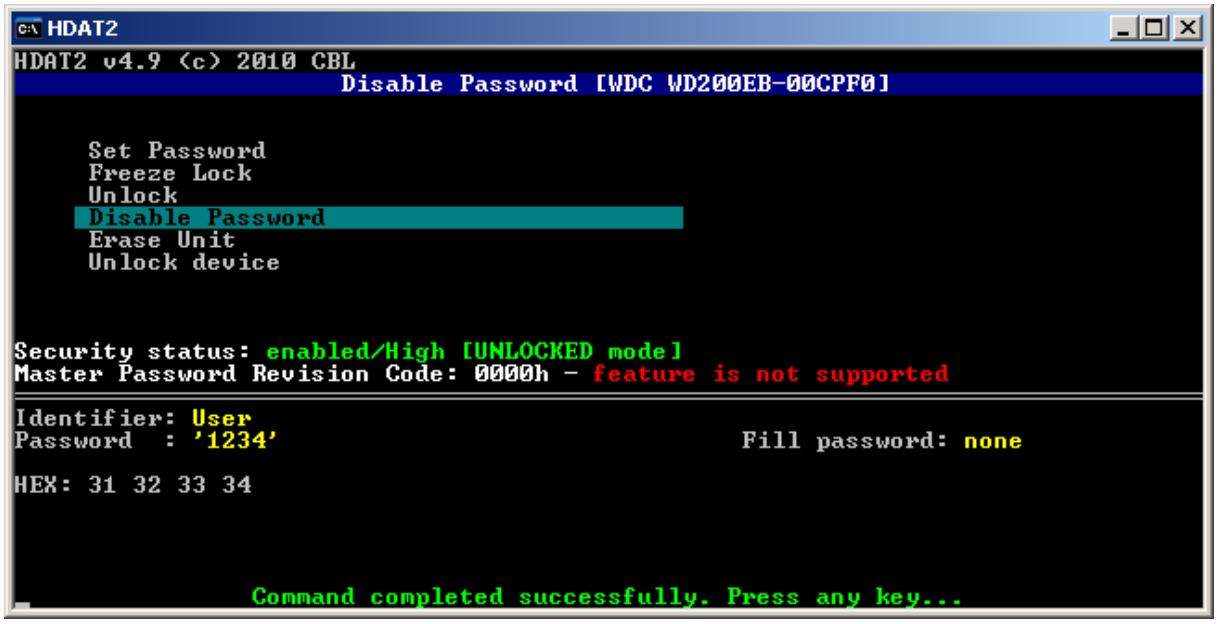
Example: To disable the high security mode of the device we have to unlock and disable password with the our user password "1234".

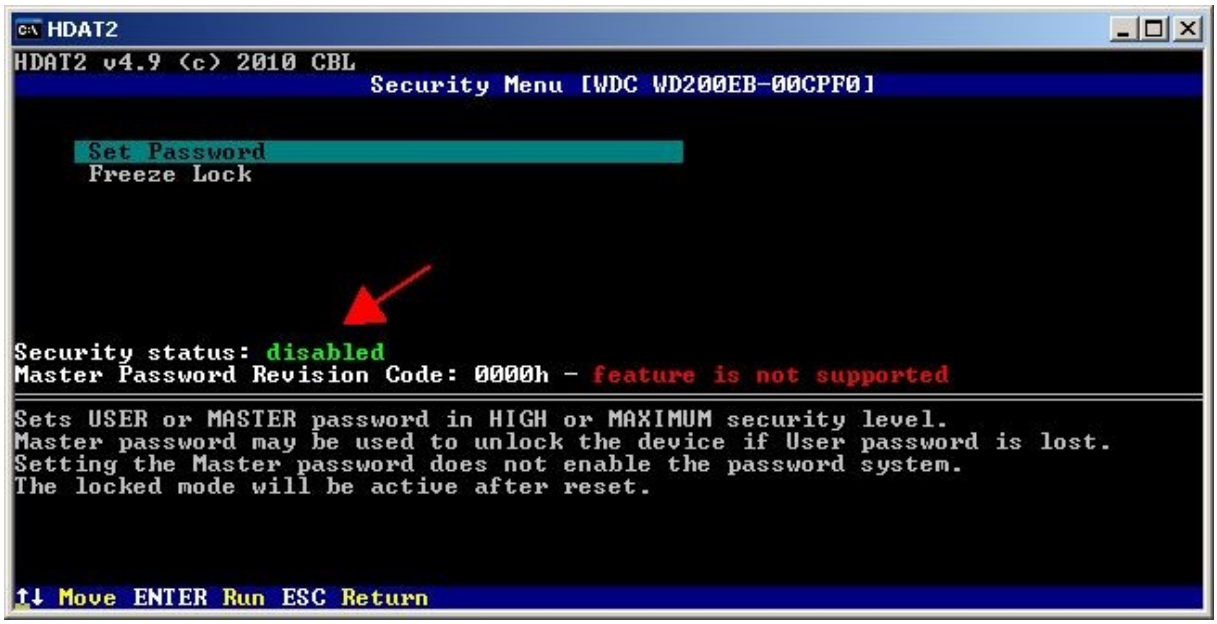

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Fill password: none
HEX: 31 32 33 34
I Identifier P Password F Fill S Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Fill password: none
HEX: 31 32 33 34
Command completed successfully. Press any key...

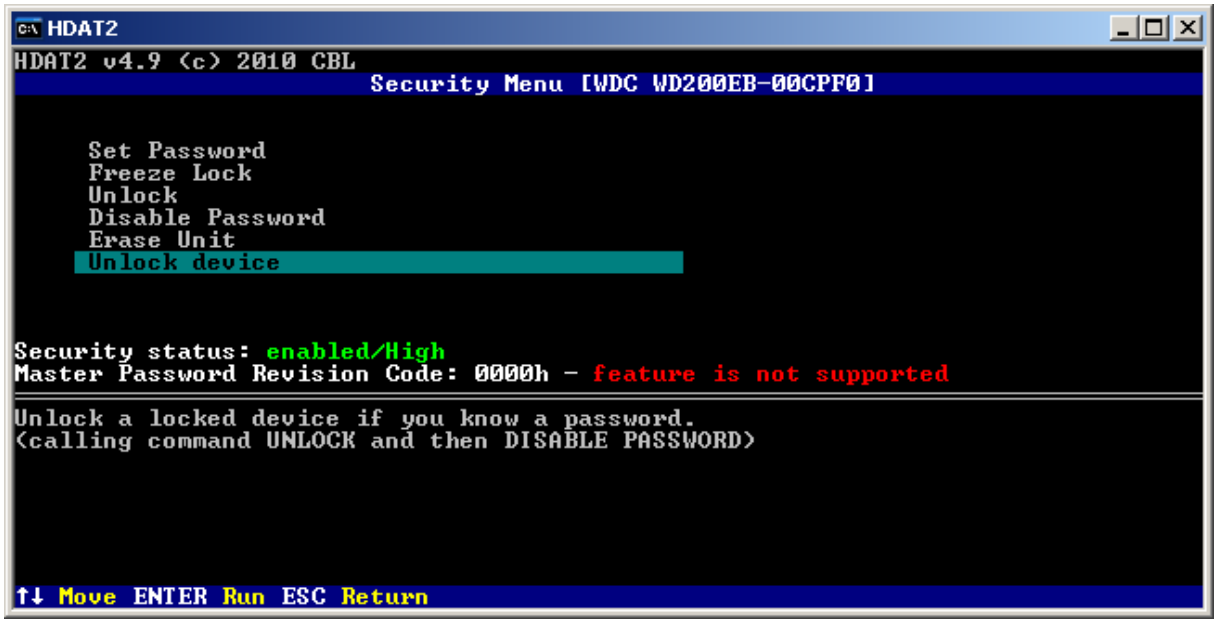

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High [UNLOCKED mode]
Master Password Revision Code: 0000h - feature is not supported
SECURITY UNLOCK (unlock counter shall be initially set to 5)
With the correct password the device shall disable the Lock mode.
The Master password shall not unlock the device in Security Level Maximum.
If the password compare fails then the device decrements the unlock counter.
↑↓ Move ENTER Run ESC Return

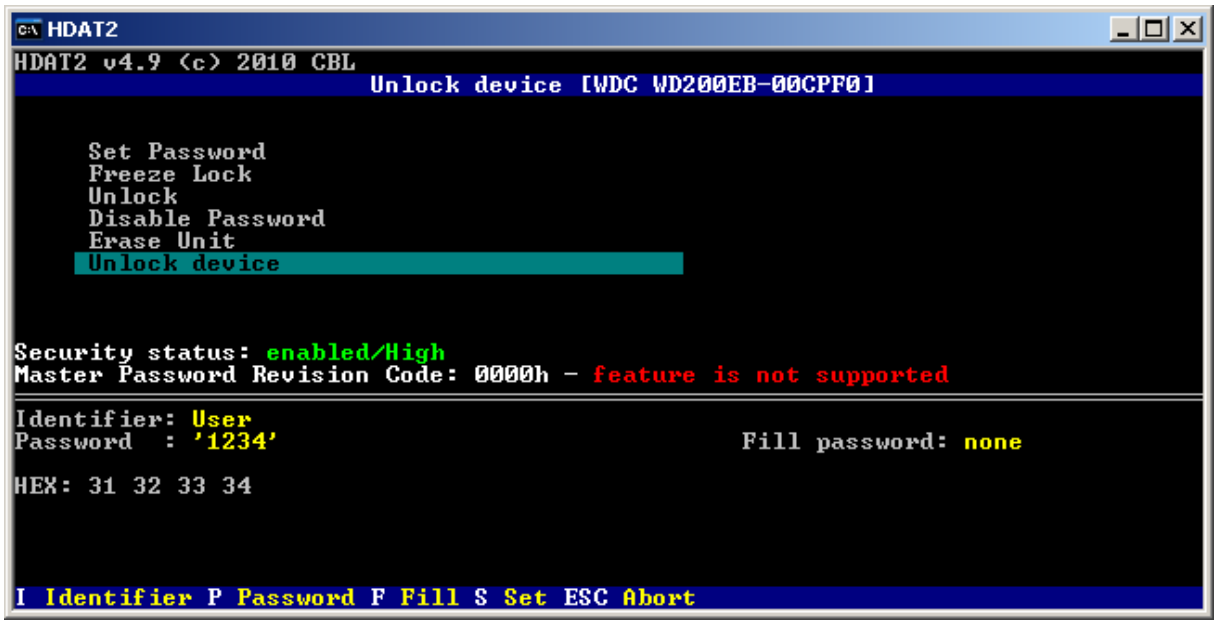


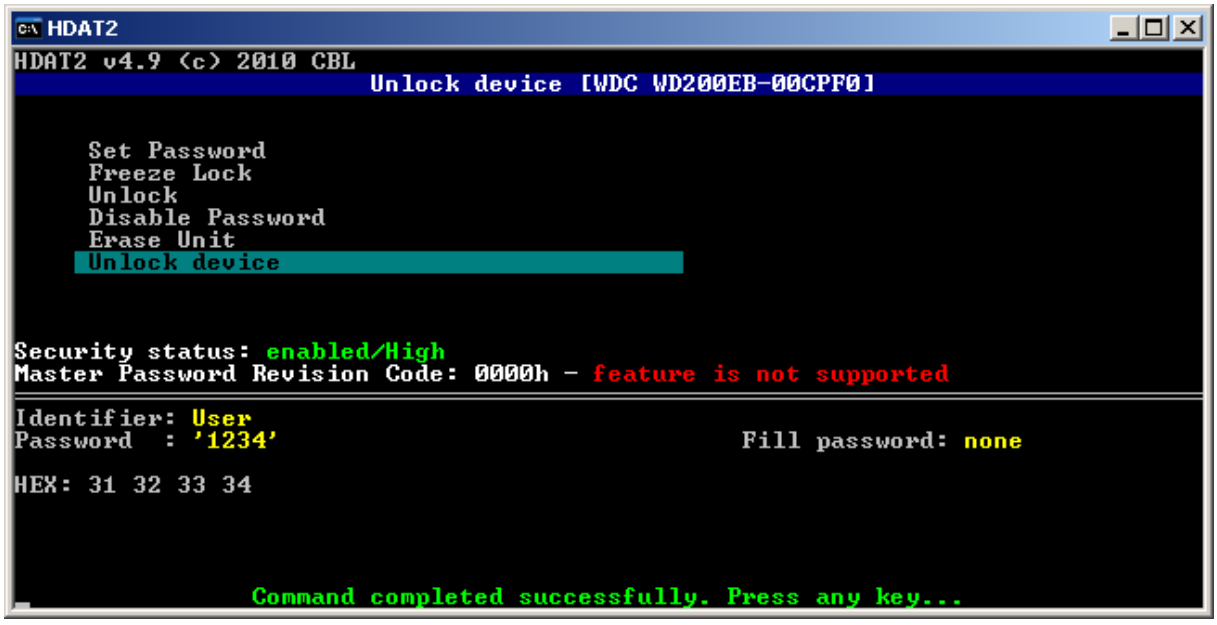


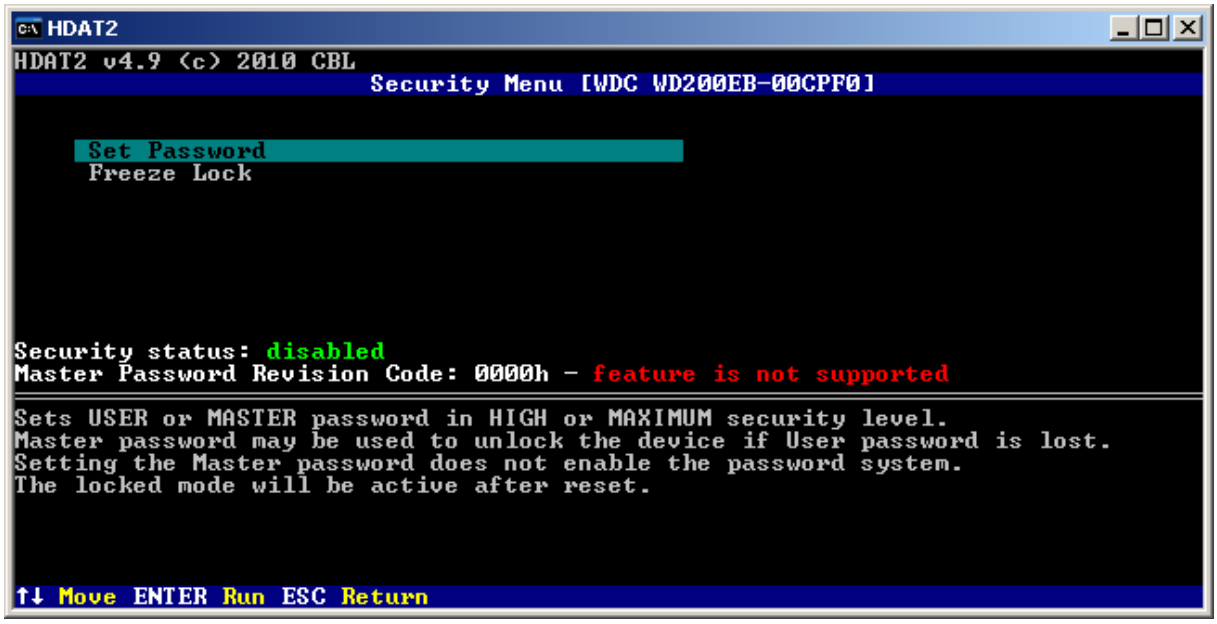

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.
↑↓ Move ENTER Run ESC Return

You can also use a special function "Unlock device".


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Unlock a locked device if you know a password.
(calling command UNLOCK and then DISABLE PASSWORD)
↑↓ Move ENTER Run ESC Return


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock device [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Fill password: none
HEX: 31 32 33 34
I Identifier P Password F Fill S Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Unlock device [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
Fill password: none
HEX: 31 32 33 34
Command completed successfully. Press any key...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.
↑↓ Move ENTER Run ESC Return

Erase the device

Overview

Erase (wipe) does not mean delete or format. Data erasure is a method of software based overwriting. It uses a application to write patterns of data (like 00h or FFh) onto each of a hard drive's sectors on all areas of a hard drive.

To erase device you can use SECURITY ERASE UNIT command in Security Menu or, when supported, SCT Write Same command in SMART Menu.

Disk overwriting programs that cannot access the entire hard drive, including hidden areas like the Host Protected Area (HPA), Device Configuration Overlay (DCO), and remapped sectors, perform **an incomplete erasure**, leaving some of the data intact.

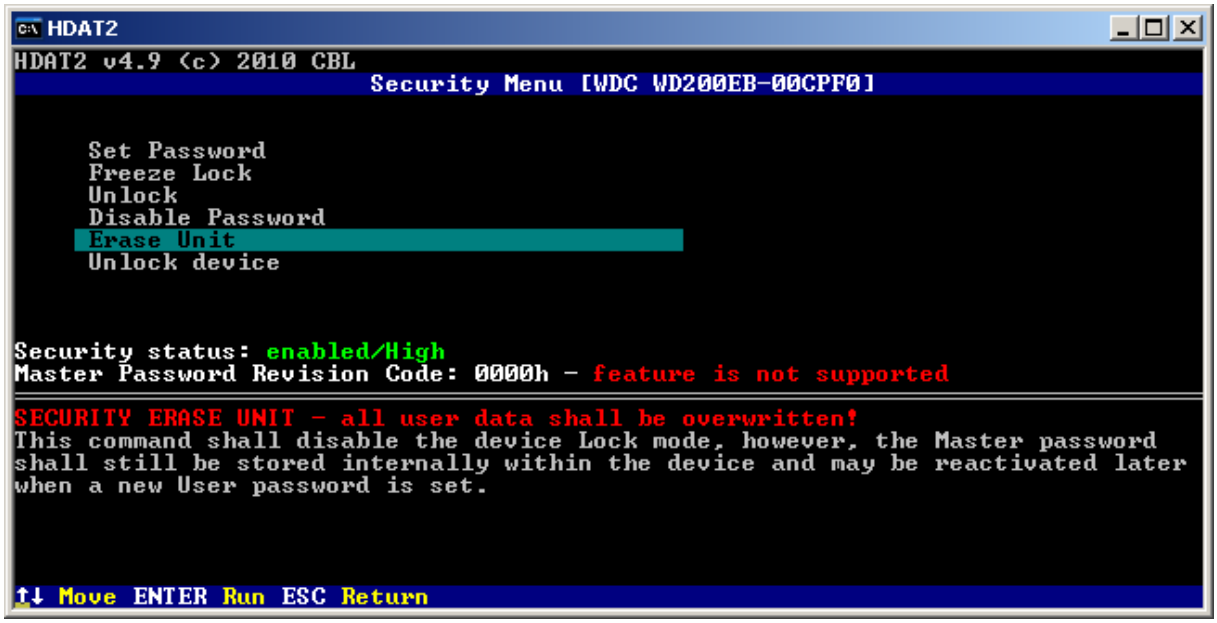
To use security erase command you should first set any password – we use password "1234".

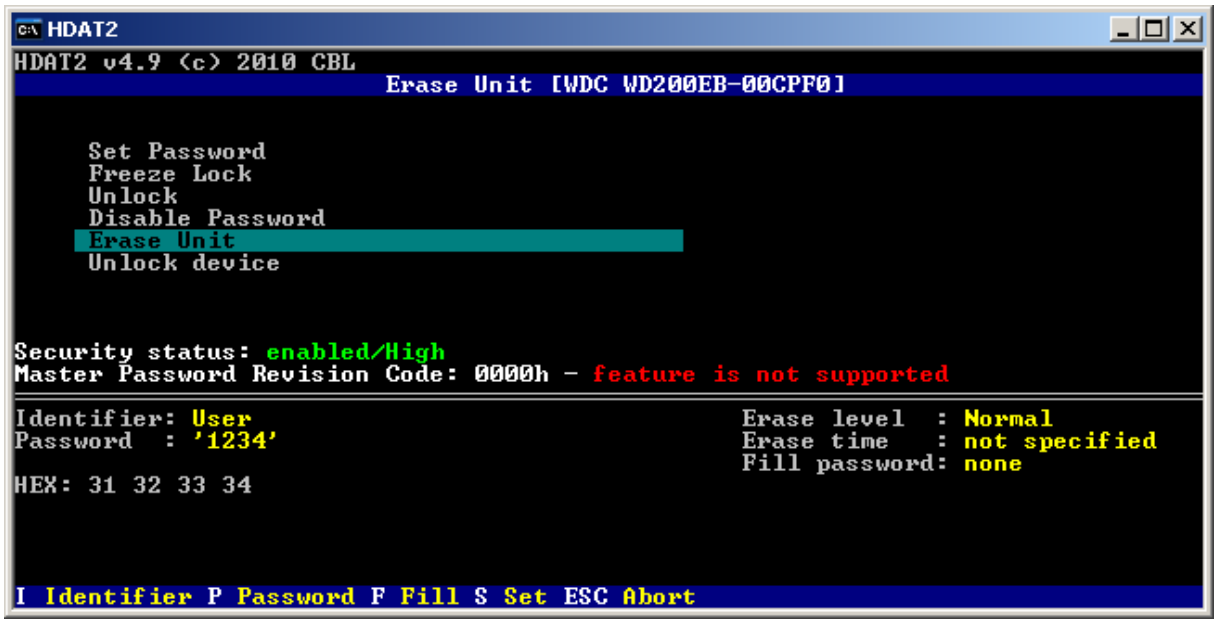
Security erase the device

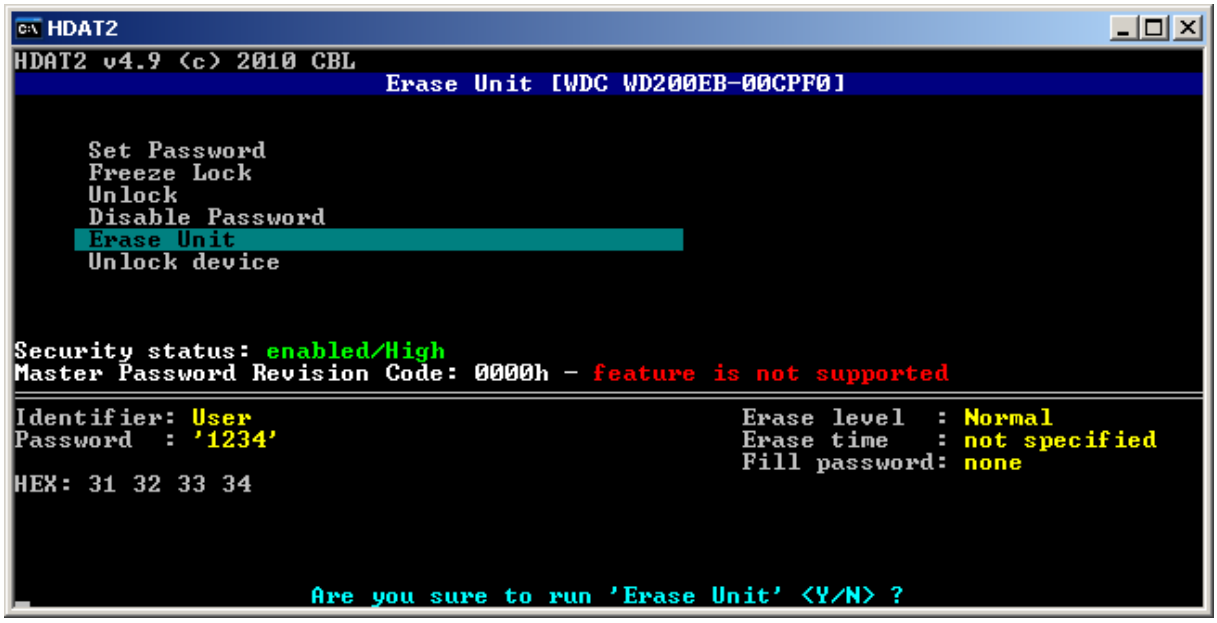
In Enhanced Erase mode, all previously written user data shall be overwritten, including sectors that are no longer in use due to reallocation.

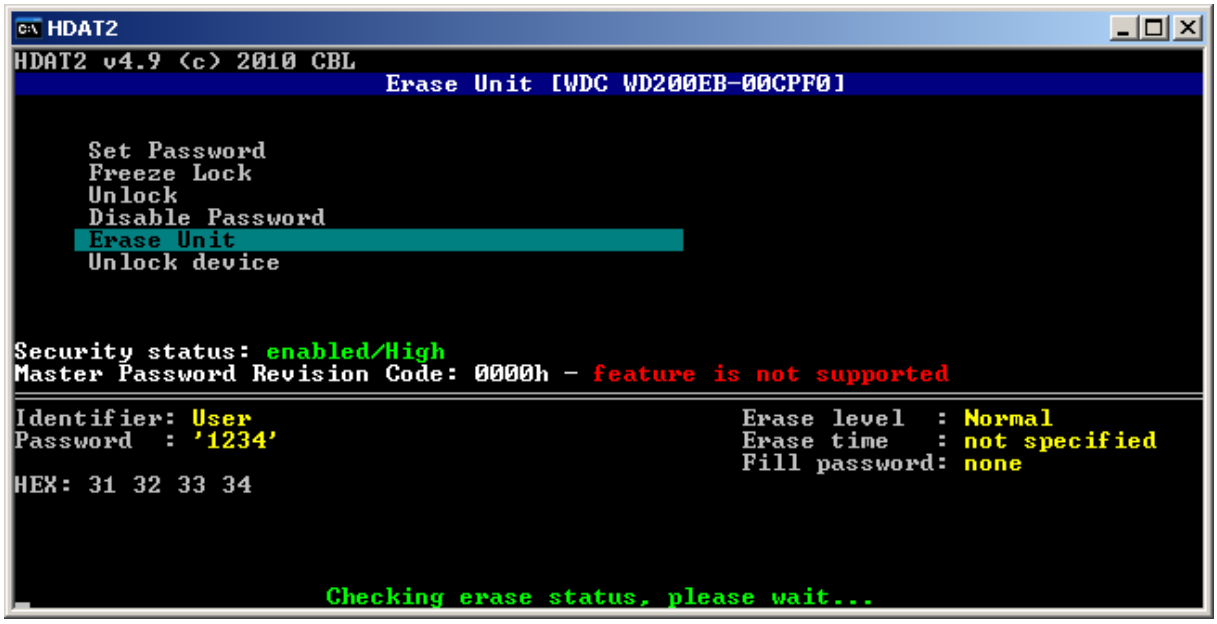
SECURITY ERASE UNIT allow erase HPA (Host Protected Area) or DCO (Device Configuration Overlay) areas, if any, as well. But don't remove these areas.

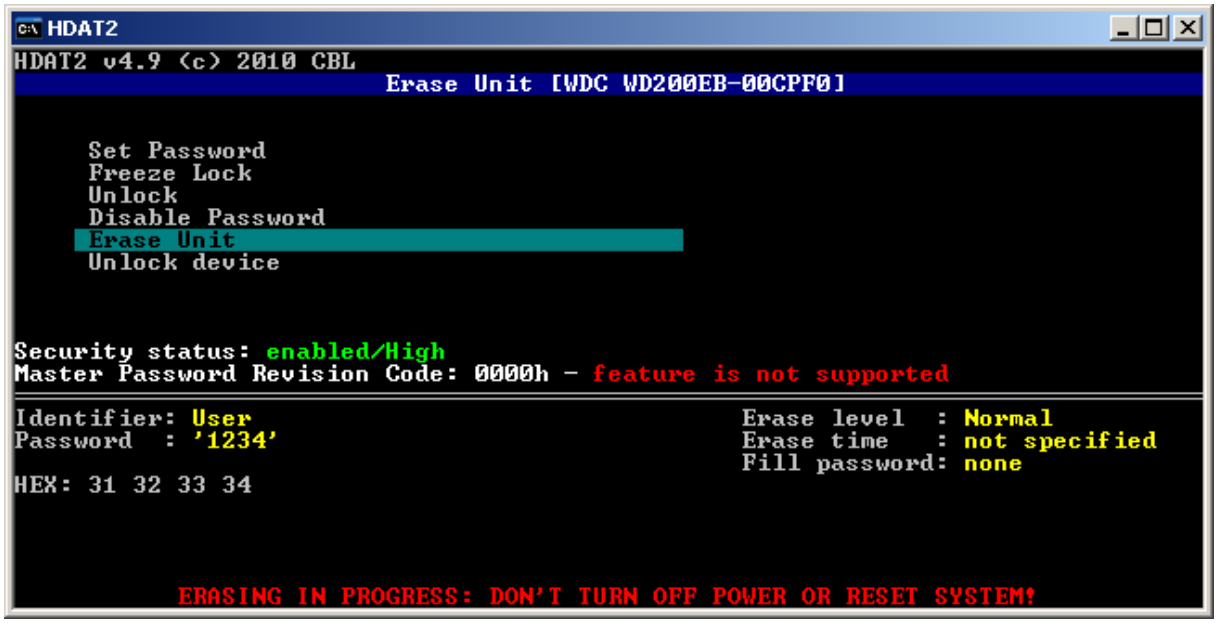
Also in High security mode the SECURITY ERASE UNIT command can be used with either the User or Master password.

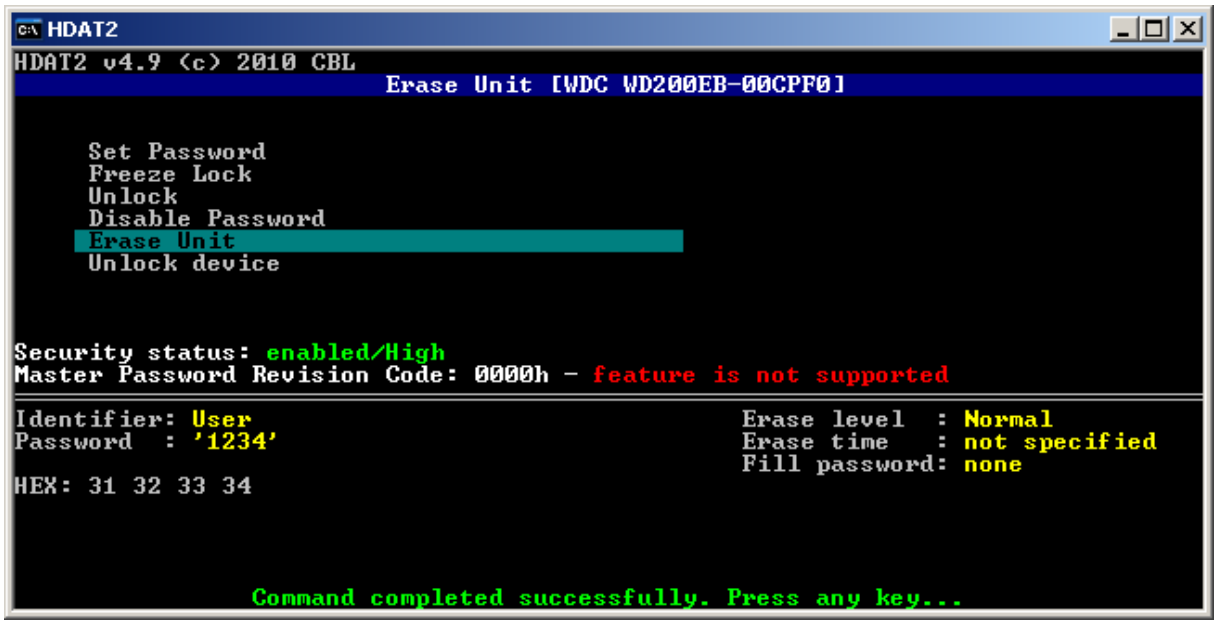

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
SECURITY ERASE UNIT - all user data shall be overwritten!
This command shall disable the device Lock mode, however, the Master password shall still be stored internally within the device and may be reactivated later when a new User password is set.
↑↓ Move ENTER Run ESC Return

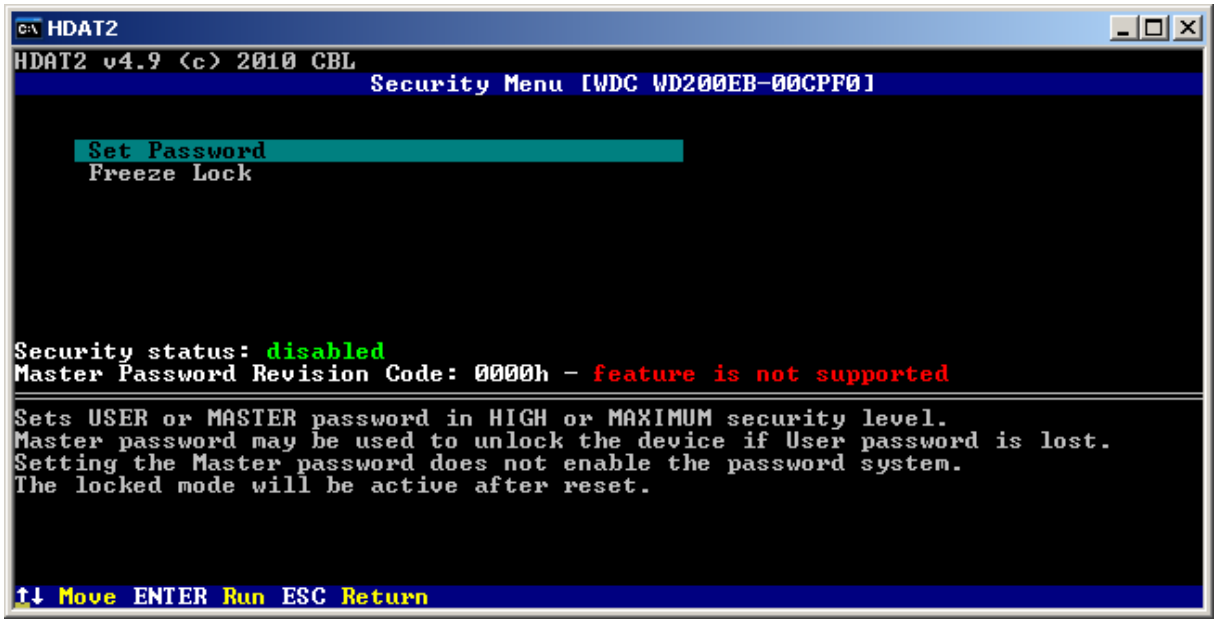

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
HEX: 31 32 33 34
Erase level : Normal
Erase time : not specified
Fill password: none
I Identifier P Password F Fill S Set ESC Abort


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
HEX: 31 32 33 34
Erase level : Normal
Erase time : not specified
Fill password: none
Are you sure to run 'Erase Unit' <Y/N> ?


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
HEX: 31 32 33 34
Erase level : Normal
Erase time : not specified
Fill password: none
Checking erase status, please wait...


HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
HEX: 31 32 33 34
Erase level : Normal
Erase time : not specified
Fill password: none
ERASING IN PROGRESS: DON'T TURN OFF POWER OR RESET SYSTEM!

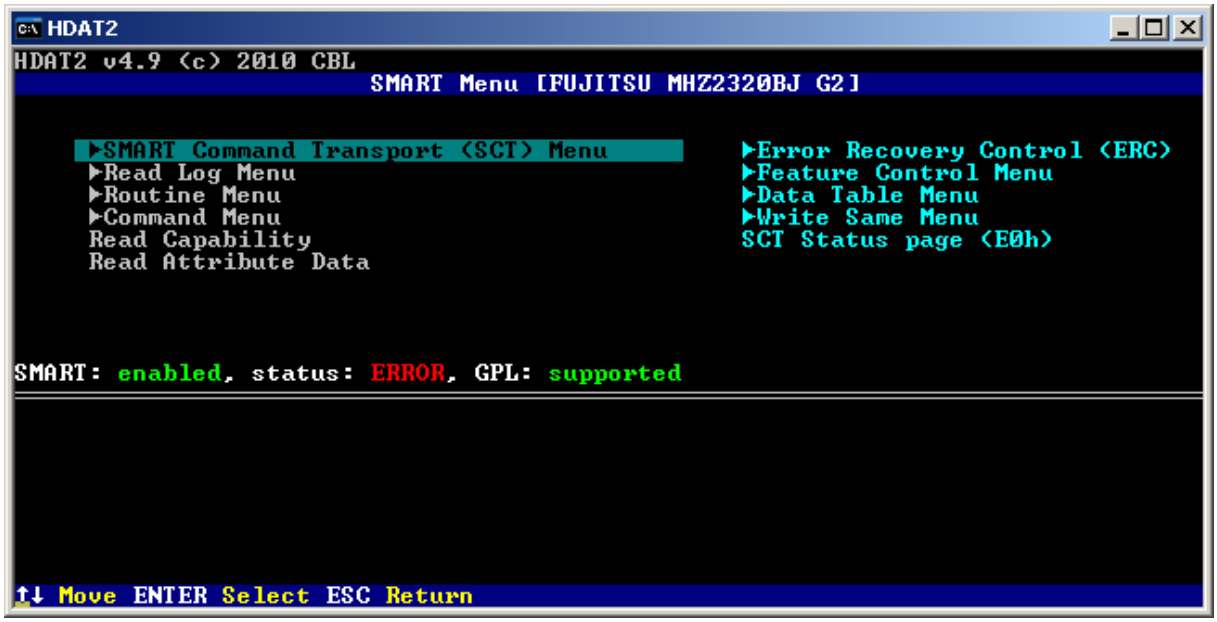

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Erase Unit [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Unlock
Disable Password
Erase Unit
Unlock device
Security status: enabled/High
Master Password Revision Code: 0000h - feature is not supported
Identifier: User
Password : '1234'
HEX: 31 32 33 34
Erase level : Normal
Erase time : not specified
Fill password: none
Command completed successfully. Press any key...

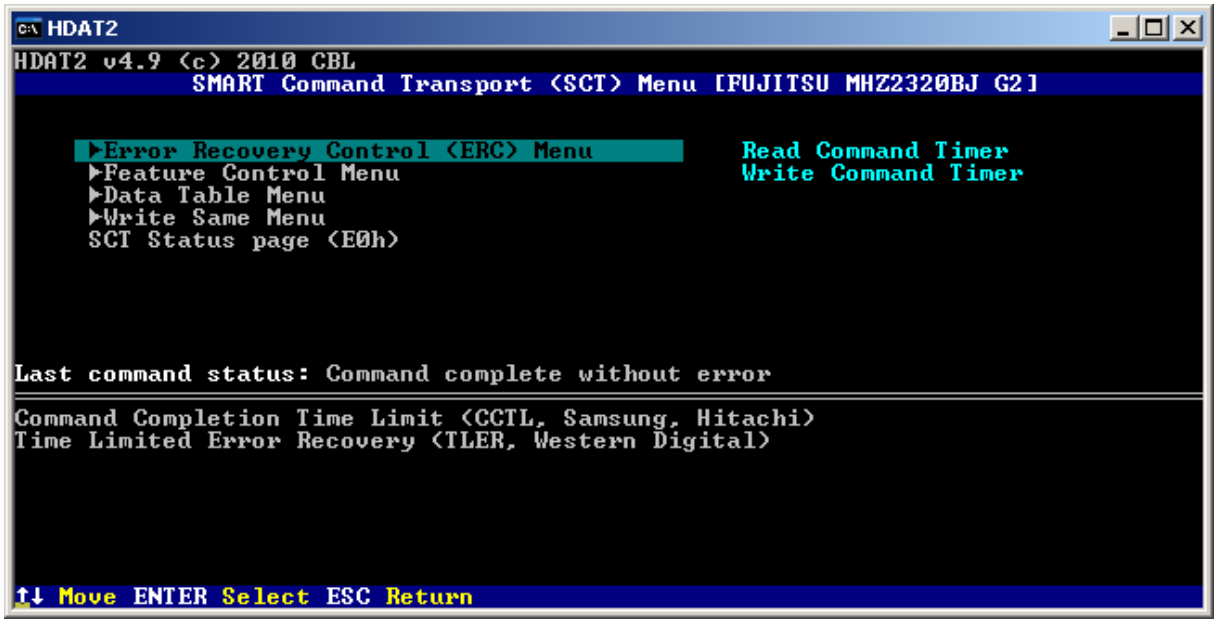

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Security Menu [WDC WD200EB-00CPF0]
Set Password
Freeze Lock
Security status: disabled
Master Password Revision Code: 0000h - feature is not supported
Sets USER or MASTER password in HIGH or MAXIMUM security level.
Master password may be used to unlock the device if User password is lost.
Setting the Master password does not enable the password system.
The locked mode will be active after reset.
↑↓ Move ENTER Run ESC Return

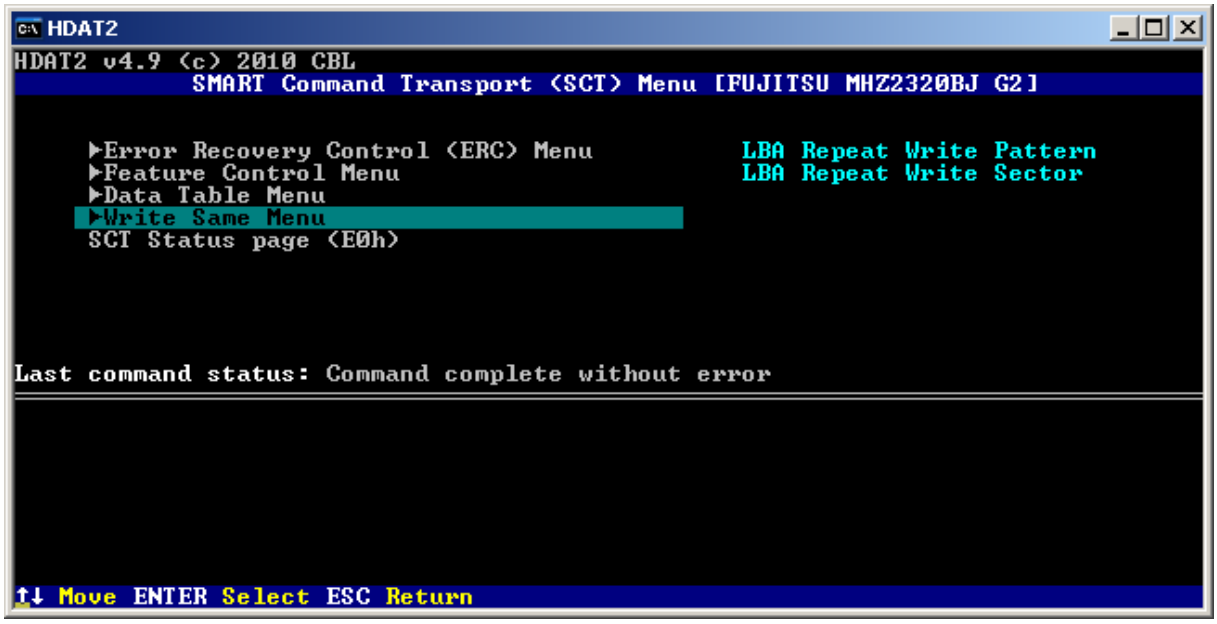
SCT Write Same

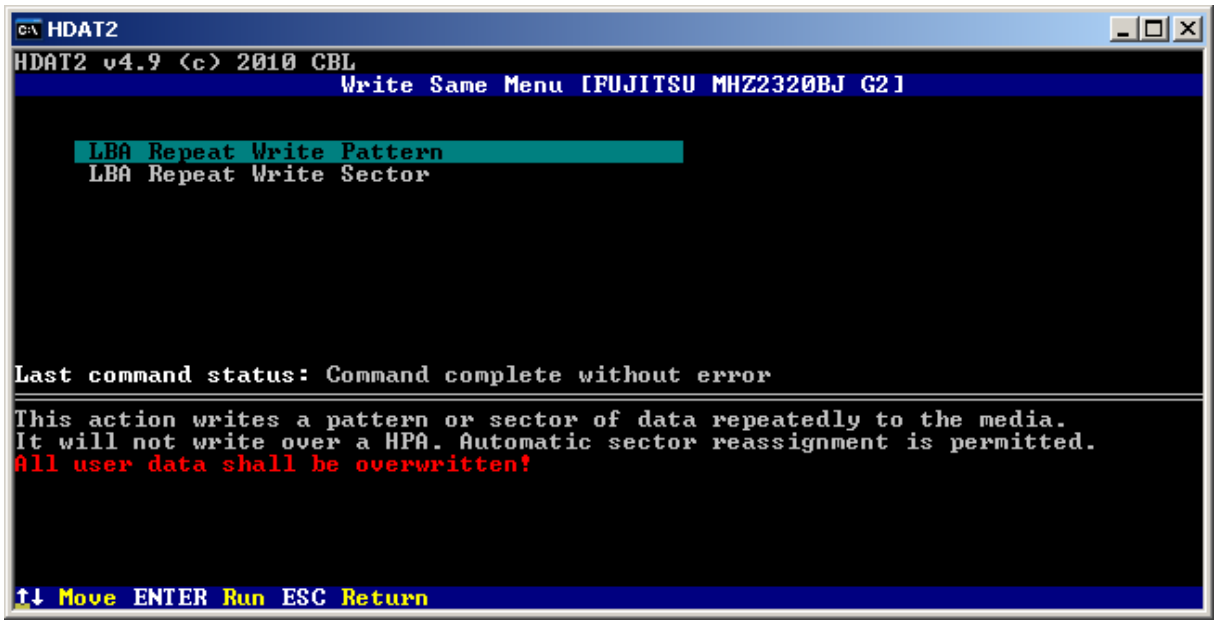
When device supports SMART Command Transport (SCT) you can use the SCT function Write Same – LBA Repeat Write Pattern or LBA Repeat Write Sector.

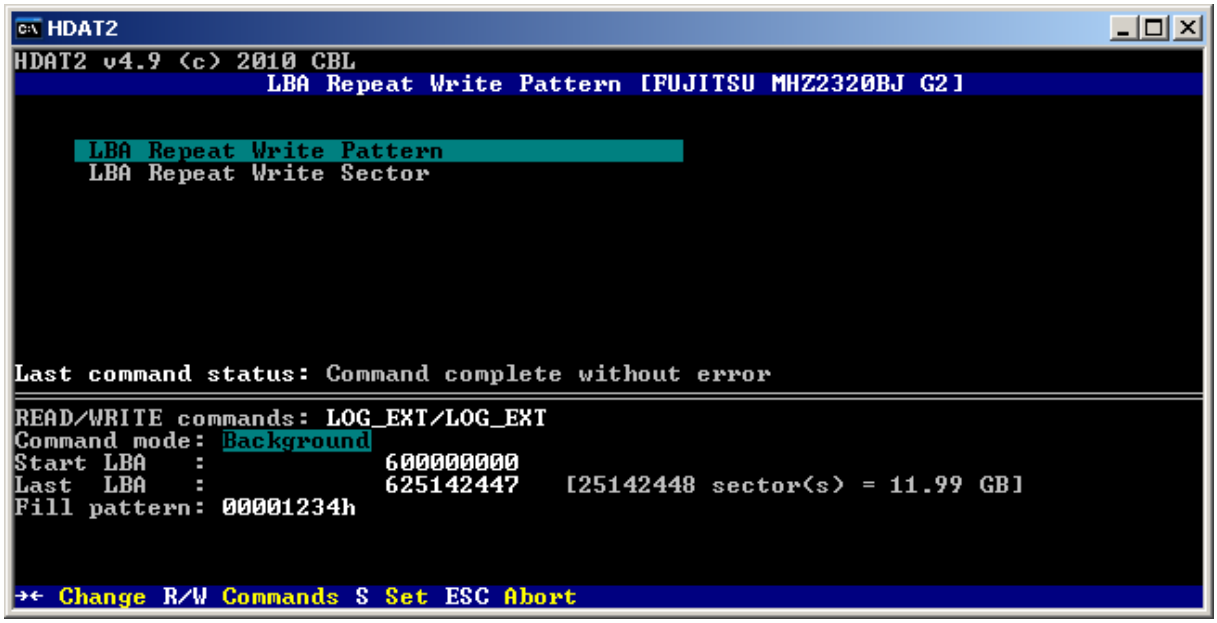
Example: We will overwrite sectors from LBA 600000000 to LBA 625142447 with hexadecimal pattern "00001234".

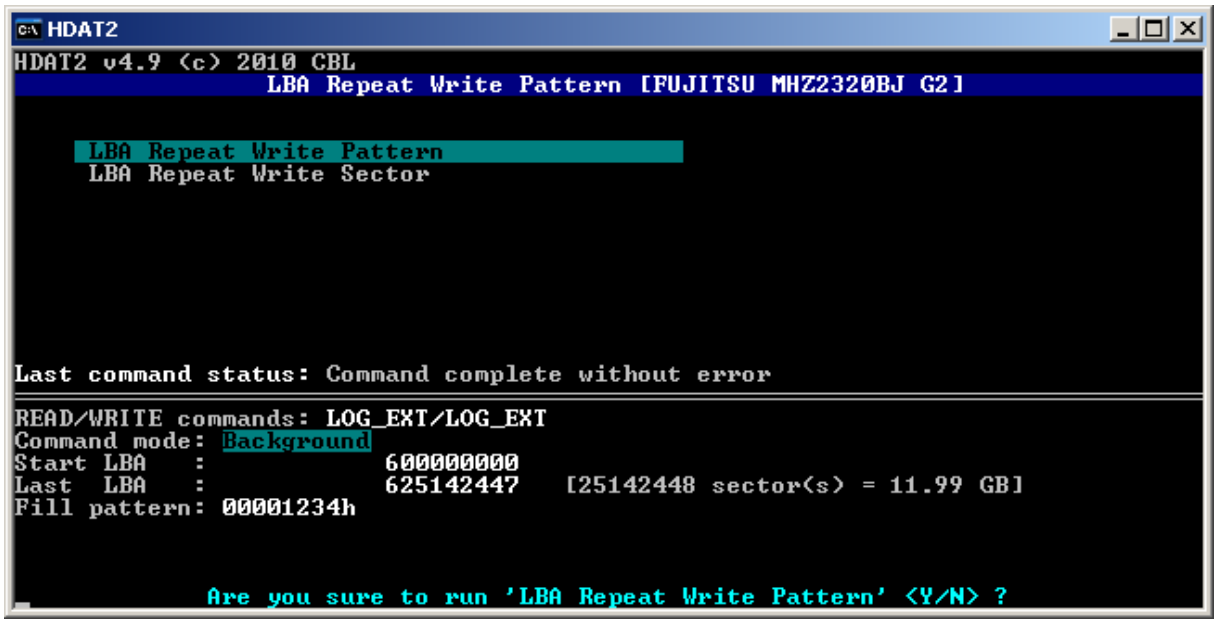


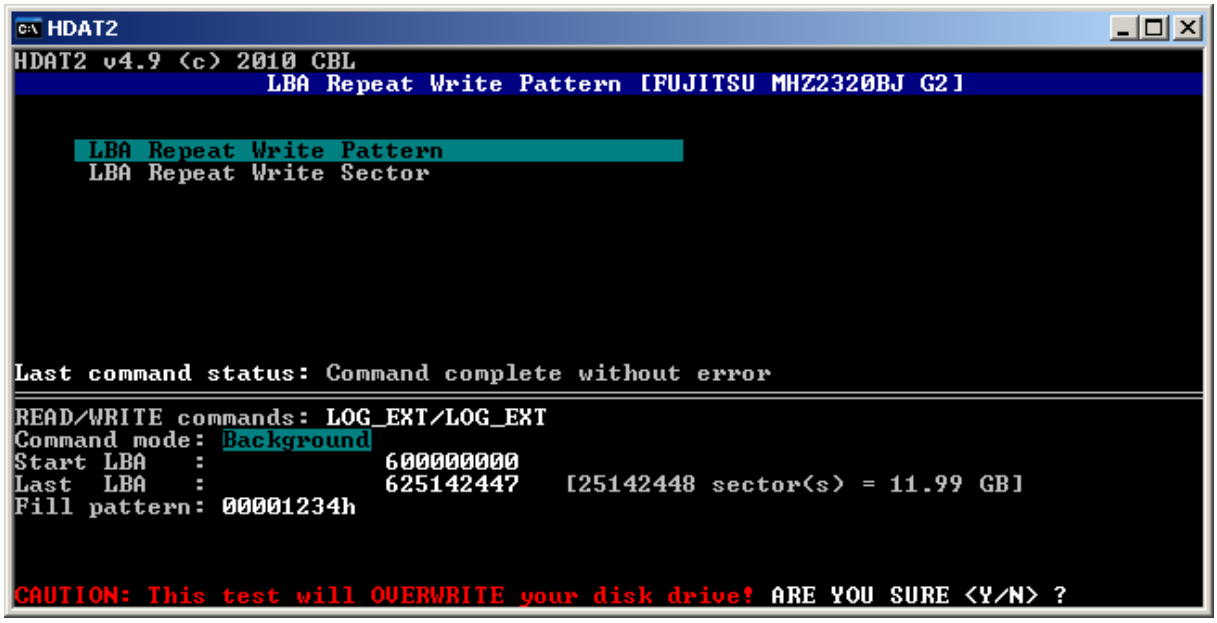

HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]
▶Error Recovery Control (ERC) Menu
▶Feature Control Menu
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)
Read Command Timer
Write Command Timer
Last command status: Command complete without error
Command Completion Time Limit (CCTL, Samsung, Hitachi)
Time Limited Error Recovery (TLER, Western Digital)
↑↓ Move ENTER Select ESC Return

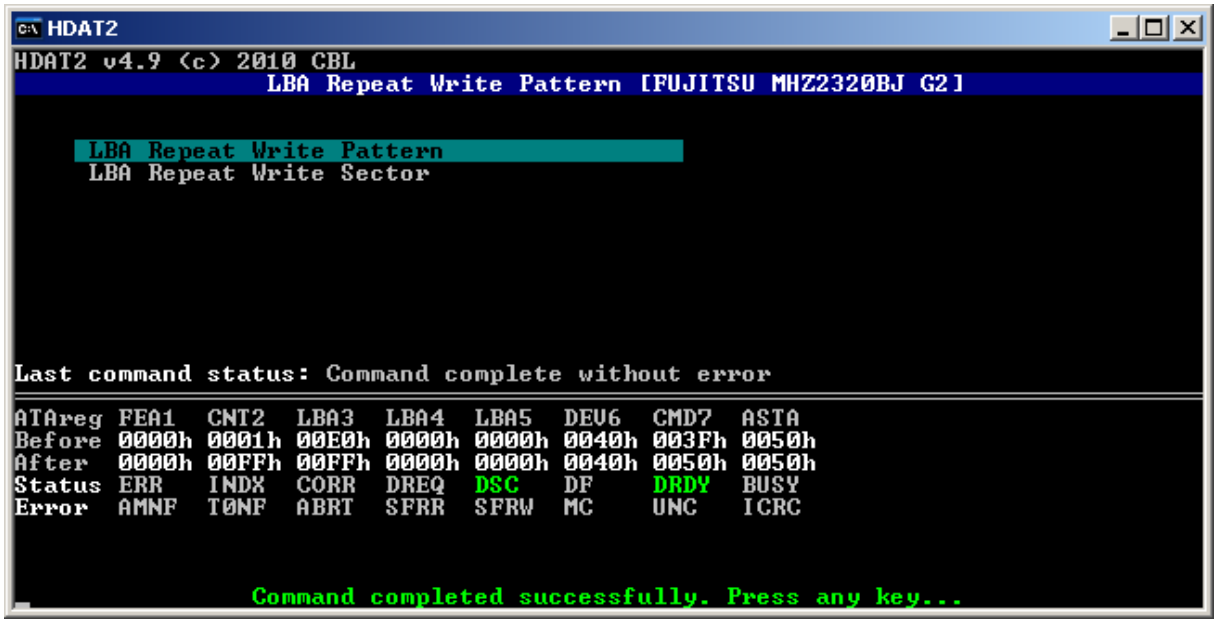

HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]
▶Error Recovery Control (ERC) Menu
▶Feature Control Menu
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
↑↓ Move ENTER Select ESC Return

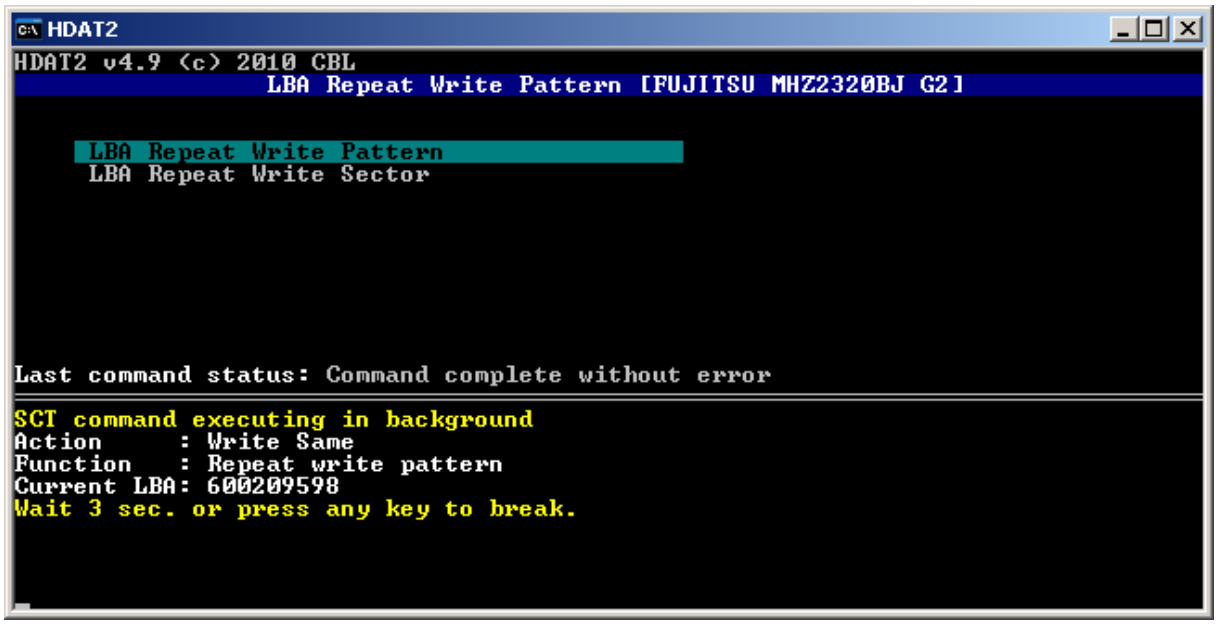

HDAT2
HDAT2 v4.9 (c) 2010 CBL
Write Same Menu [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
This action writes a pattern or sector of data repeatedly to the media.
It will not write over a HPA. Automatic sector reassignment is permitted.
All user data shall be overwritten!
↑↓ Move ENTER Run ESC Return


HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h
→← Change R/W Commands S Set ESC Abort

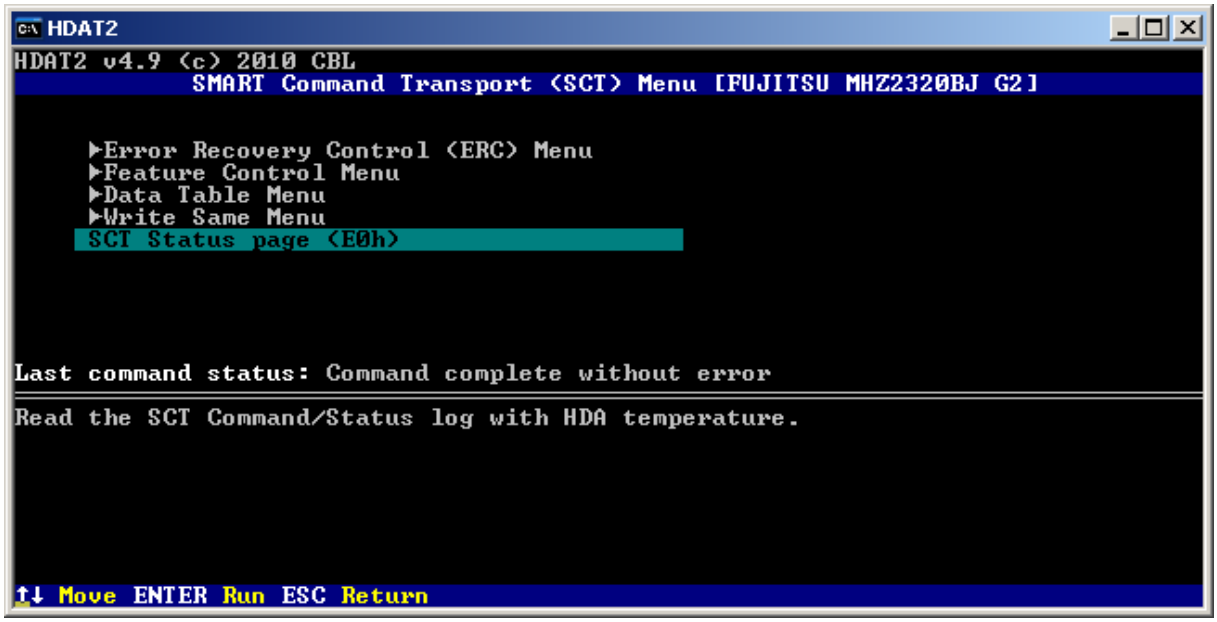

HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h
Are you sure to run 'LBA Repeat Write Pattern' <Y/N> ?

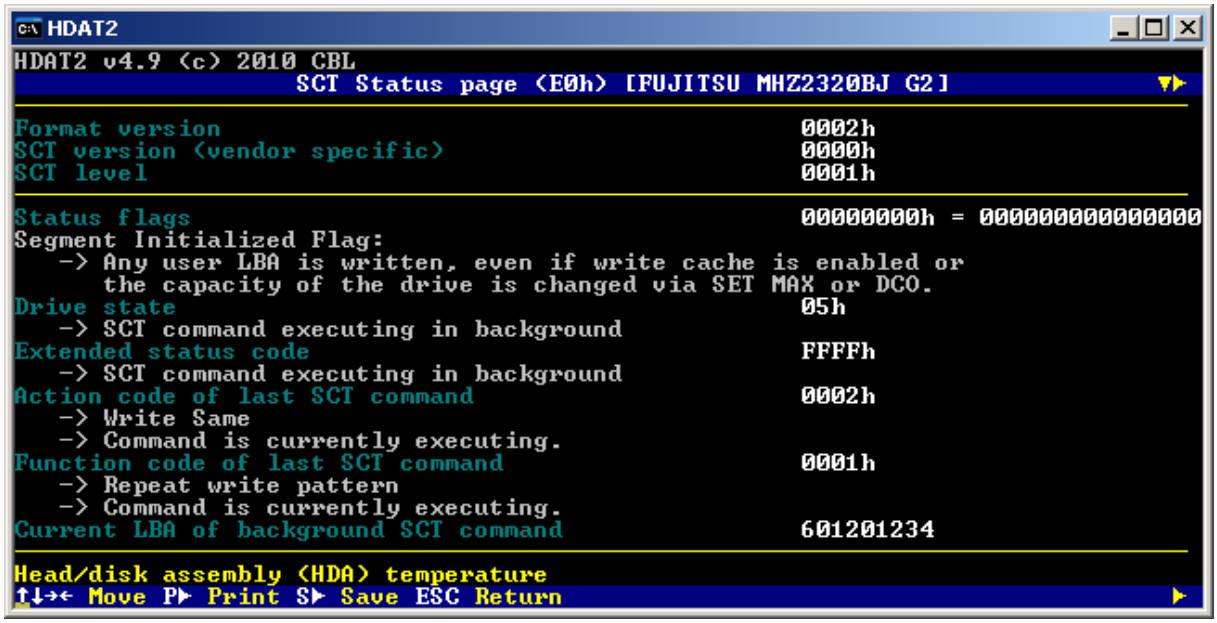

HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
READ/WRITE commands: LOG_EXT/LOG_EXT
Command mode: Background
Start LBA : 600000000
Last LBA : 625142447 [25142448 sector(s) = 11.99 GB]
Fill pattern: 00001234h
CAUTION: This test will OVERWRITE your disk drive! ARE YOU SURE <Y/N> ?


HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
ATAreg FEA1 CNT2 LBA3 LBA4 LBA5 DEV6 CMD7 ASTA
Before 0000h 0001h 00E0h 0000h 0000h 0040h 003Fh 0050h
After 0000h 00FFh 00FFh 0000h 0000h 0040h 0050h 0050h
Status ERR INDX CORR DREQ DSC DF DRDY BUSY
Error AMNF T0NF ABRT SFRR SFRW MC UNC ICRC
Command completed successfully. Press any key...

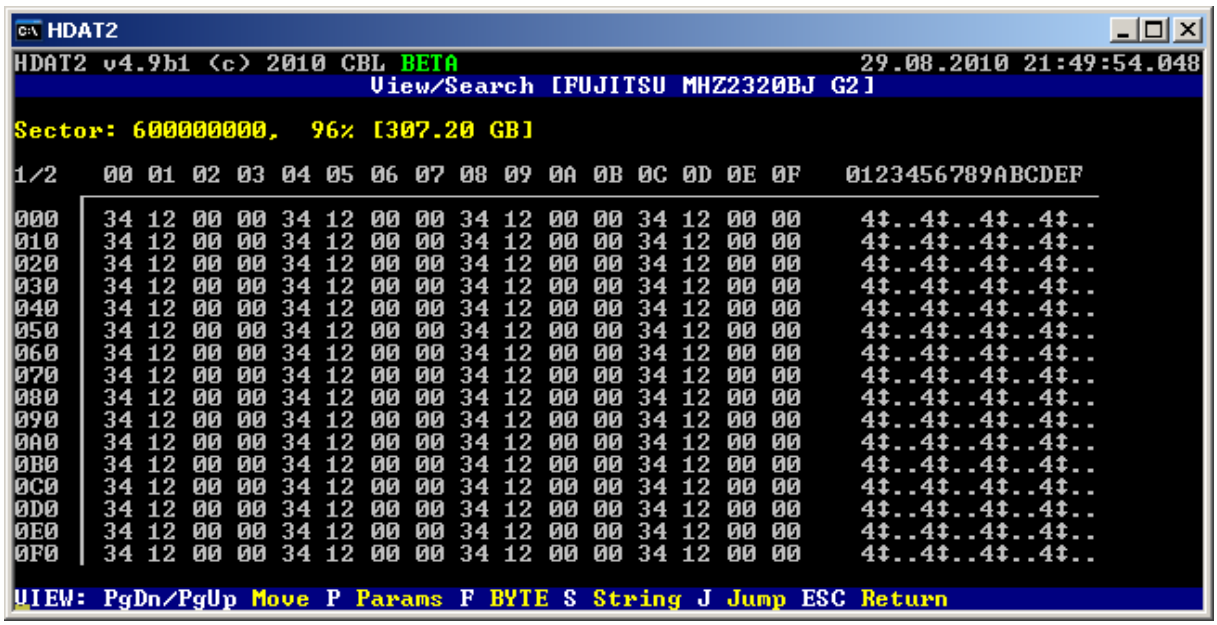

HDAT2
HDAT2 v4.9 (c) 2010 CBL
LBA Repeat Write Pattern [FUJITSU MHZ2320BJ G2]
LBA Repeat Write Pattern
LBA Repeat Write Sector
Last command status: Command complete without error
SCT command executing in background
Action : Write Same
Function : Repeat write pattern
Current LBA: 600209598
Wait 3 sec. or press any key to break.

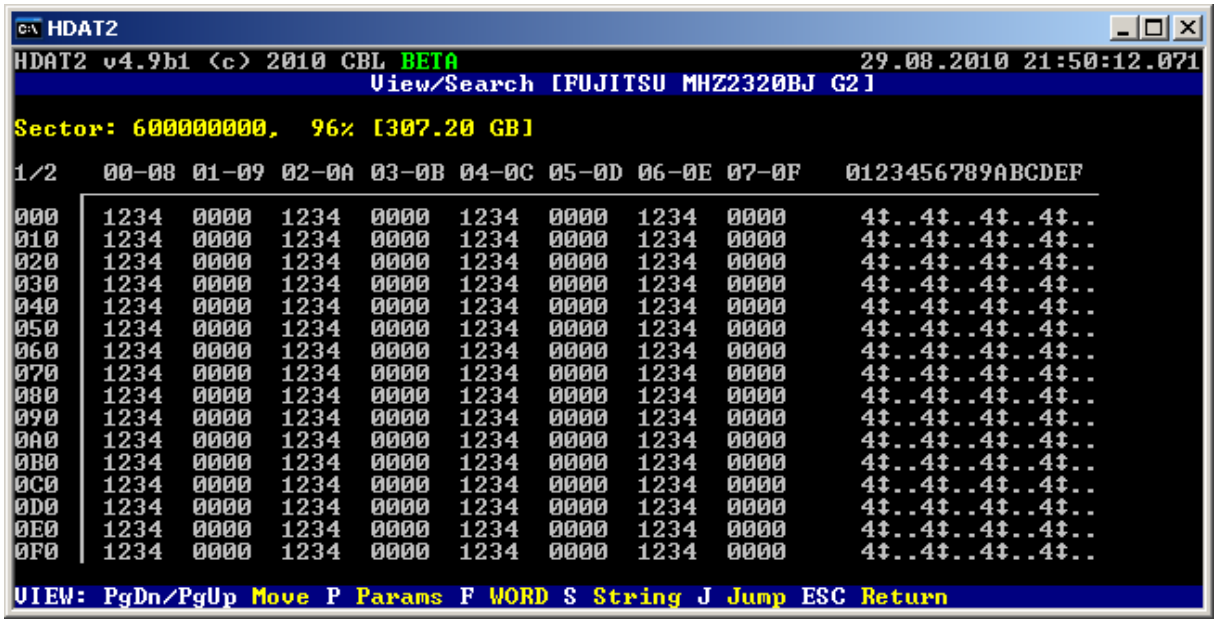
You can also check command status in SCT status page.

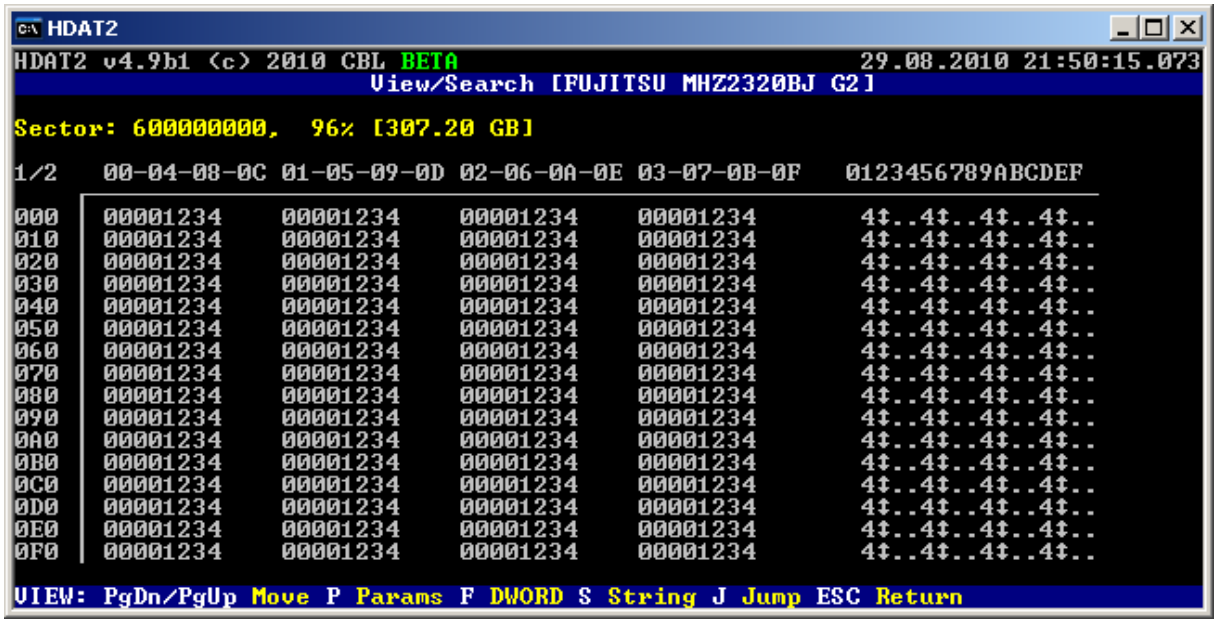

HDAT2
HDAT2 v4.9 (c) 2010 CBL
SMART Command Transport (SCT) Menu [FUJITSU MHZ2320BJ G2]
▶Error Recovery Control (ERC) Menu
▶Feature Control Menu
▶Data Table Menu
▶Write Same Menu
SCT Status page (E0h)
Last command status: Command complete without error
Read the SCT Command/Status log with HDA temperature.
↑↓ Move ENTER Run ESC Return


HDAT2
HDAT2 v4.9 (c) 2010 CBL
SCT Status page (E0h) [FUJITSU MHZ2320BJ G2]
Format version 0002h
SCT version (vendor specific) 0000h
SCT level 0001h
Status flags 00000000h = 0000000000000000
Segment Initialized Flag:
-> Any user LBA is written, even if write cache is enabled or
the capacity of the drive is changed via SET MAX or DCO.
Drive state 05h
-> SCT command executing in background
Extended status code FFFFh
-> SCT command executing in background
Action code of last SCT command 0002h
-> Write Same
-> Command is currently executing.
Function code of last SCT command 0001h
-> Repeat write pattern
-> Command is currently executing.
Current LBA of background SCT command 601201234
Head/disk assembly (HDA) temperature
Move P Print S Save ESC Return

In "View/Search Device" you can check the content of overwritten sectors.






HDAT2
HDAT2 v4.9b1 (c) 2010 CBL BETA 29.08.2010 21:50:15.073
View/Search [FUJITSU MHZ2320BJ G2]
Sector: 600000000, 96% [307.20 GB]
1/2 00-04-08-0C 01-05-09-0D 02-06-0A-0E 03-07-0B-0F 0123456789ABCDEF
000 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
010 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
020 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
030 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
040 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
050 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
060 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
070 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
080 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
090 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0A0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0B0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0C0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0D0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0E0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
0F0 00001234 00001234 00001234 00001234 4‡..4‡..4‡..4‡..
VIEW: PgDn/PgUp Move P Params F DWORD S String J Jump ESC Return

Search the device

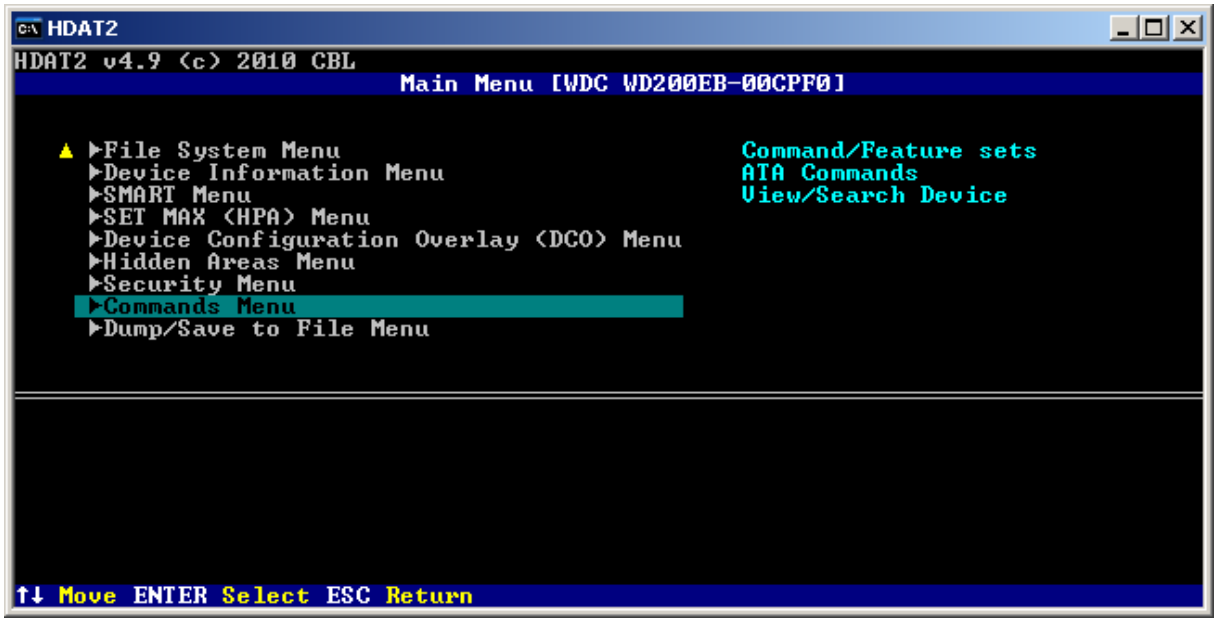
You can search a string, empty sector or non-empty sector.

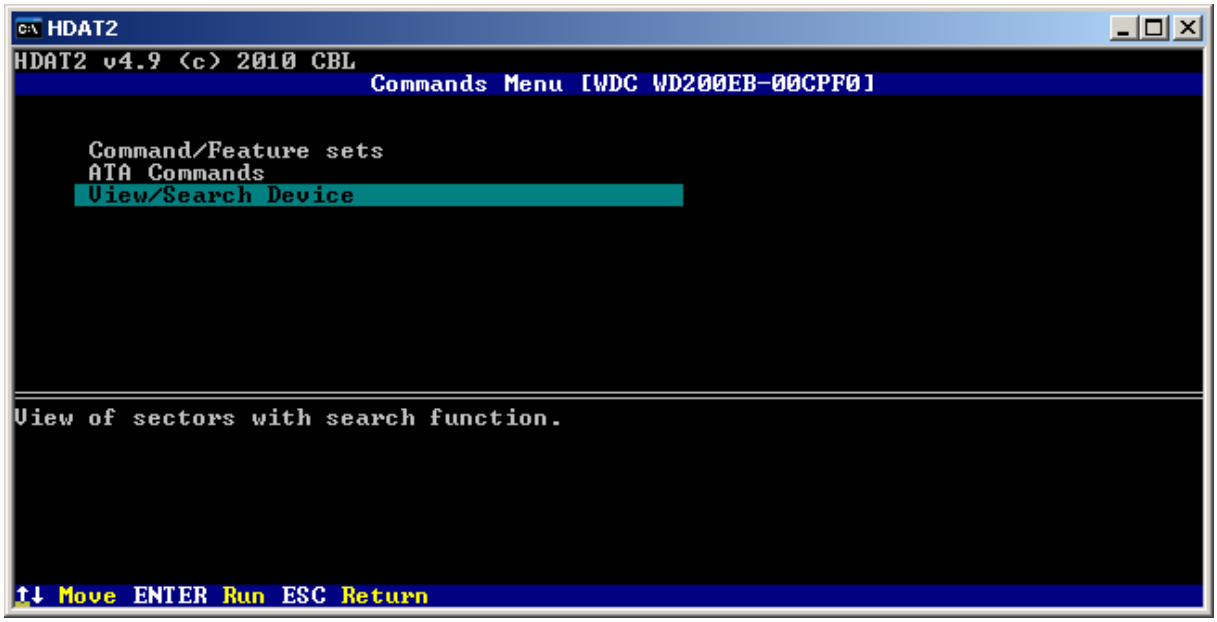
Search for string

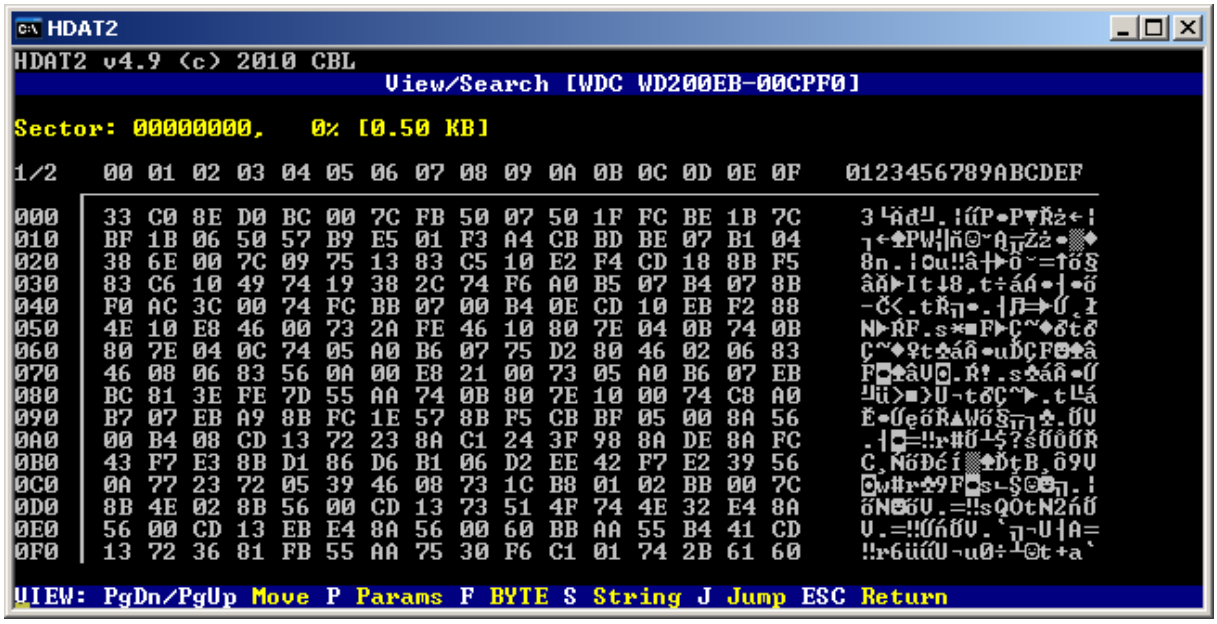
You can search a string with these parameters:

- case or non case sensitive
- string type (ASCII or UNICODE)
- position in sector

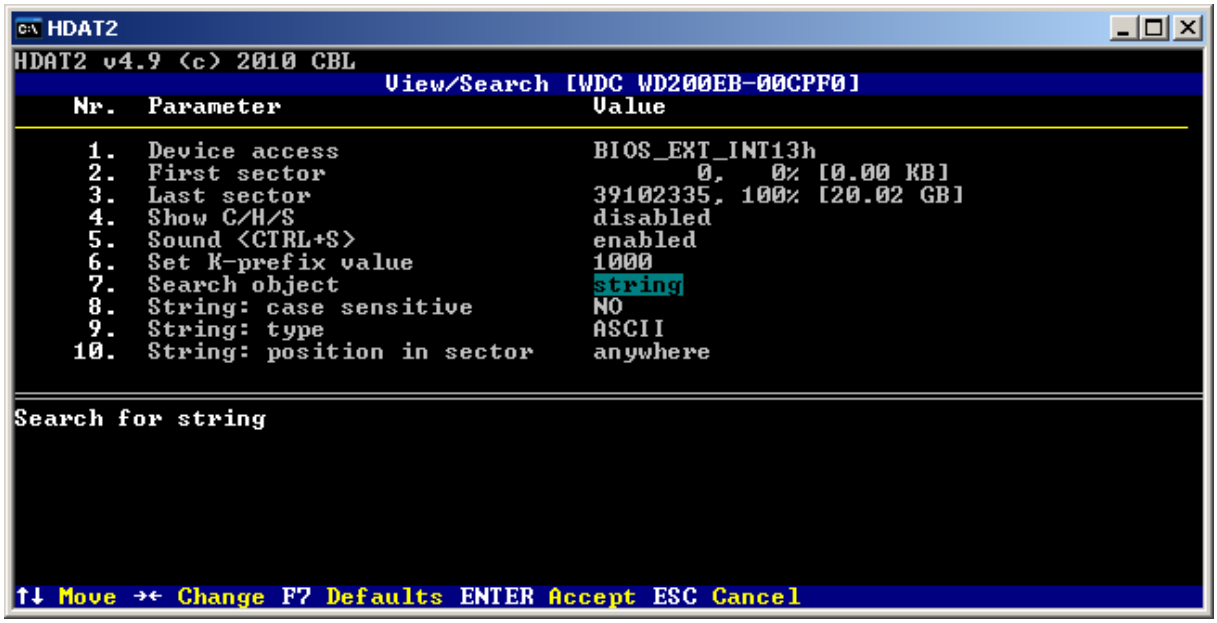
Example: We want to search string "U¬" (hexadecimal 55h and AAh), in non case sensitive mode and only when this string is on fixed position 510 in sector. This could be e.g. master boot record (MBR) or boot sector.

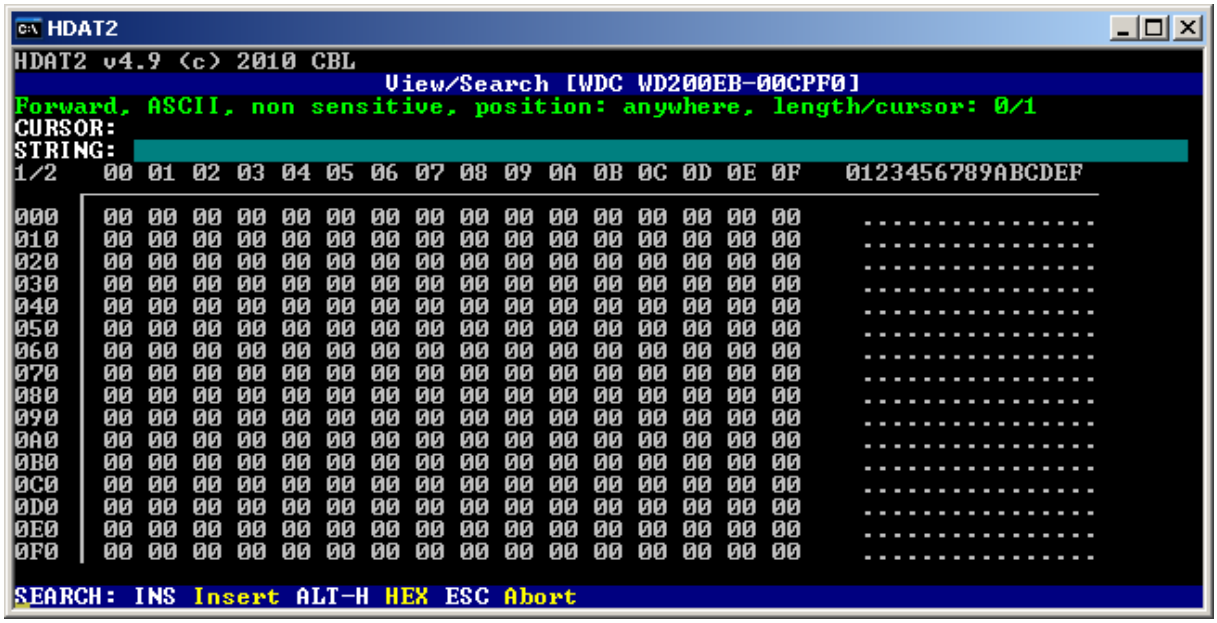




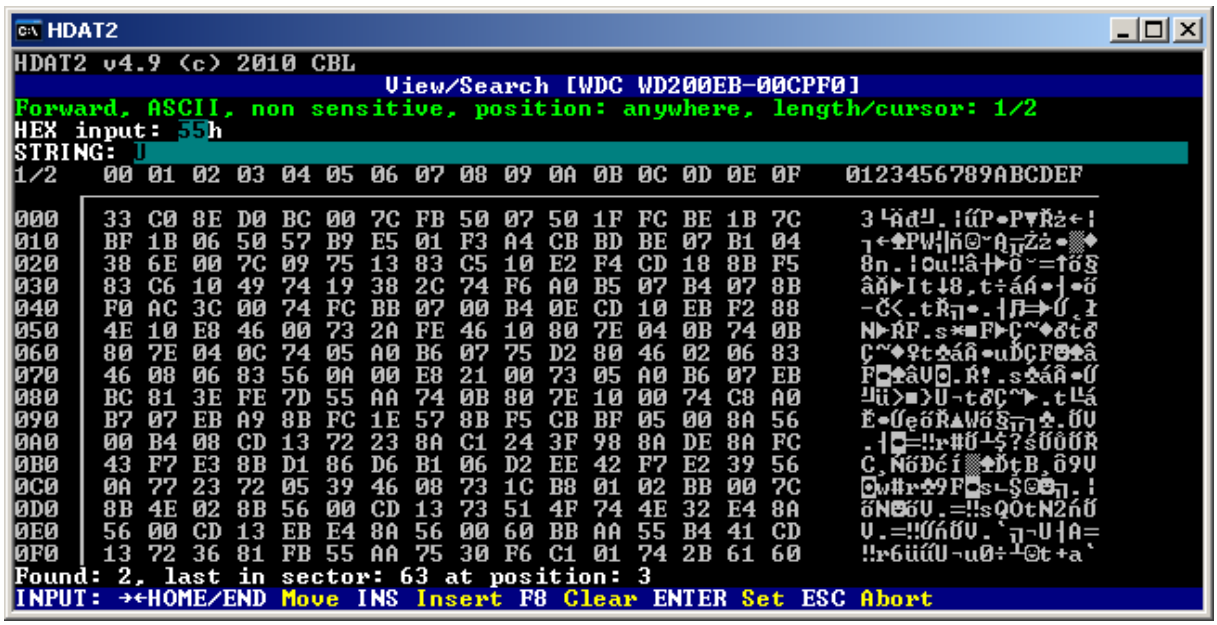


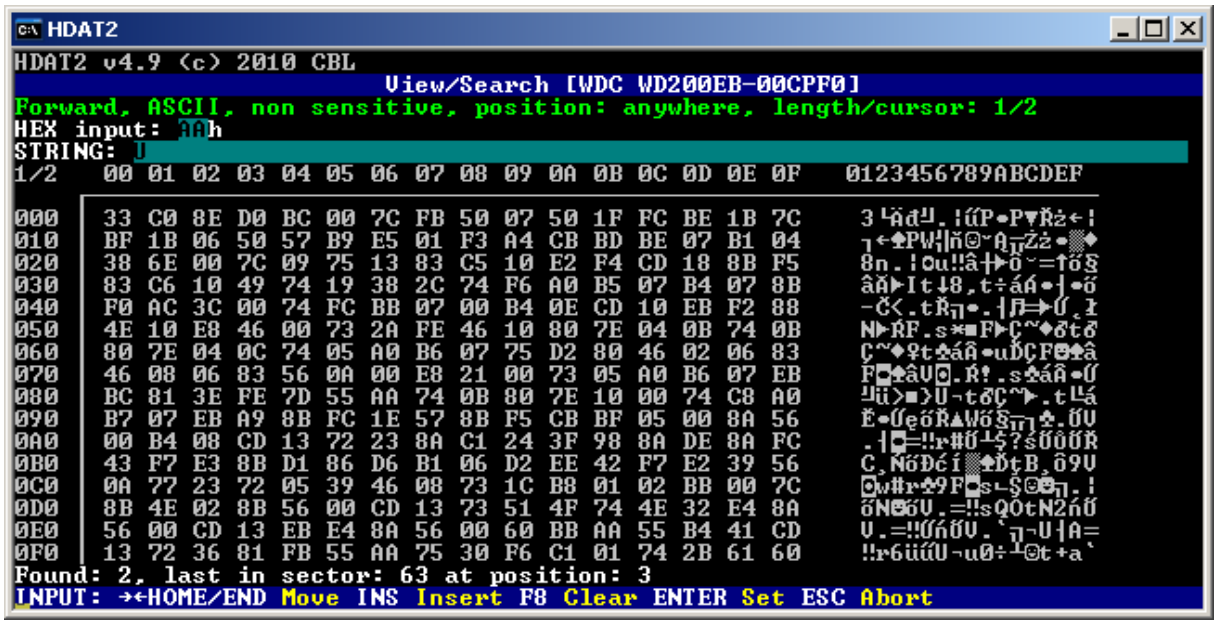
In parameters menu (with a key "P") you can select type of search object: string, empty sector or non-empty sector.

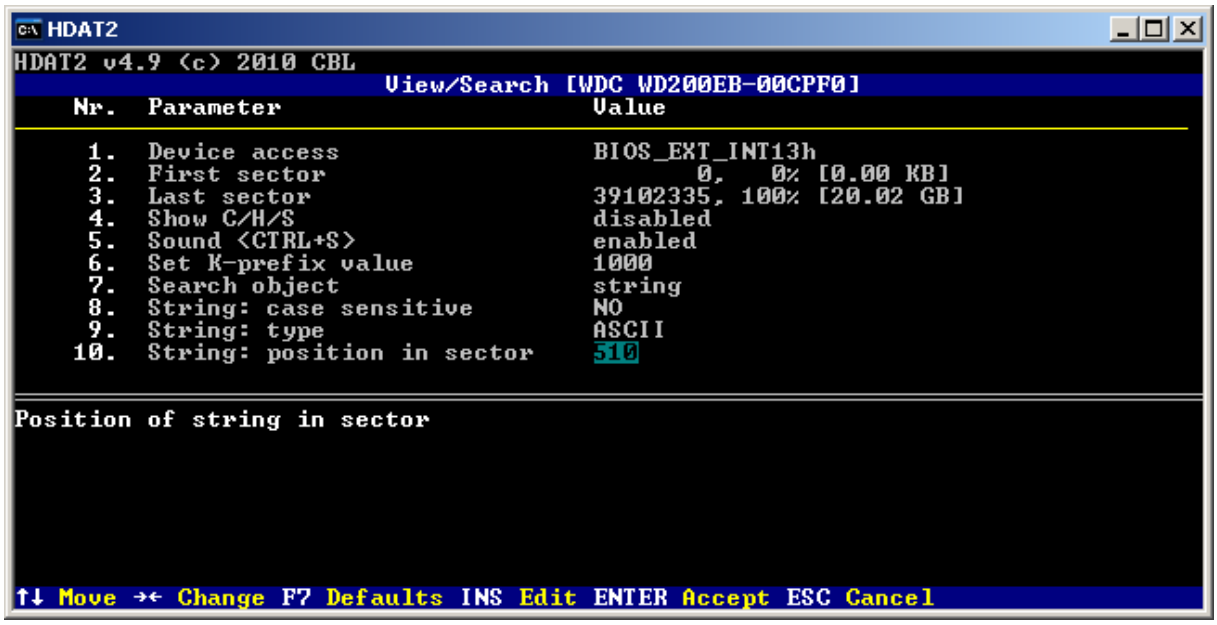

HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr. Parameter Value
1. Device access BIOS_EXT_INT13h
2. First sector 0, 0% [0.00 KB]
3. Last sector 39102335, 100% [20.02 GB]
4. Show C/H/S disabled
5. Sound <CTRL+S> enabled
6. Set K-prefix value 1000
7. Search object string
8. String: case sensitive NO
9. String: type ASCII
10. String: position in sector anywhere
Search for string
↑↓ Move →← Change F7 Defaults ENTER Accept ESC Cancel

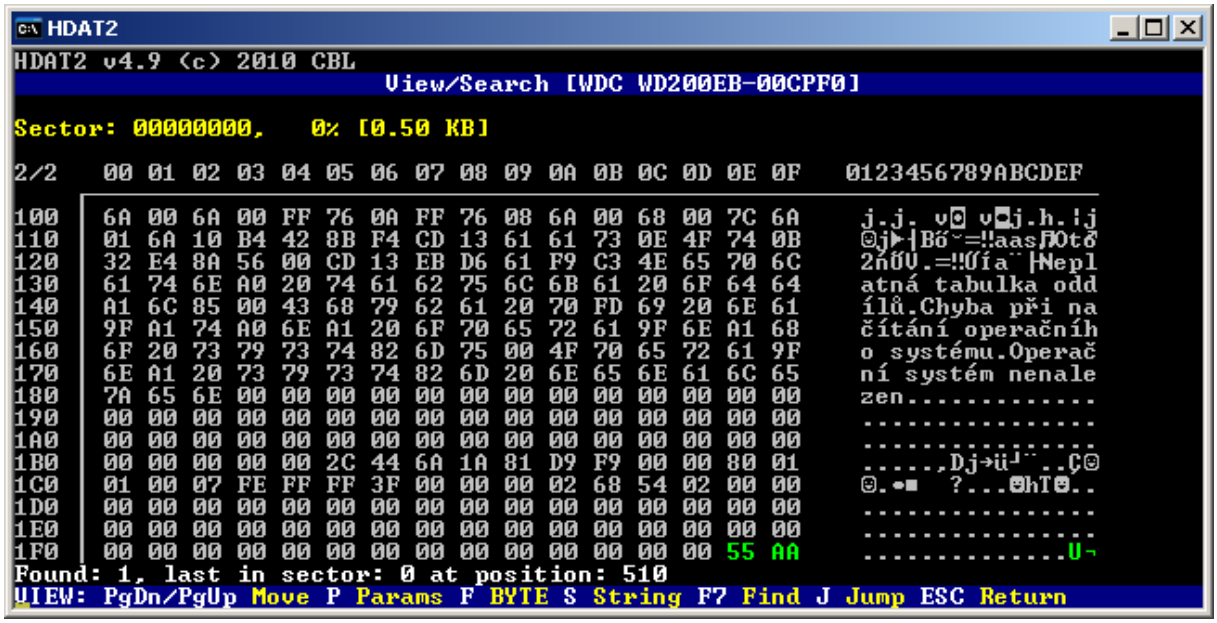


With "ALT-H" you can insert any hexadecimal value.





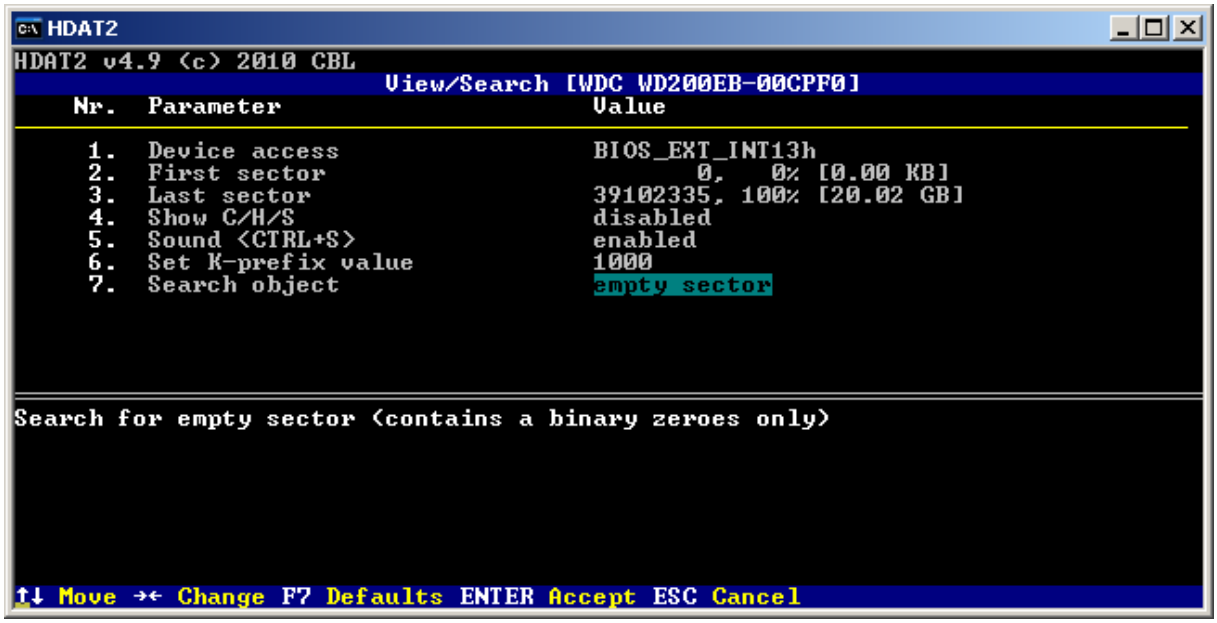

HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr. Parameter Value
1. Device access BIOS_EXT_INT13h
2. First sector 0, 0% [0.00 KB]
3. Last sector 39102335, 100% [20.02 GB]
4. Show C/H/S disabled
5. Sound <CTRL+S> enabled
6. Set K-prefix value 1000
7. Search object string
8. String: case sensitive NO
9. String: type ASCII
10. String: position in sector 510
Position of string in sector
↑↓ Move →← Change F7 Defaults INS Edit ENTER Accept ESC Cancel

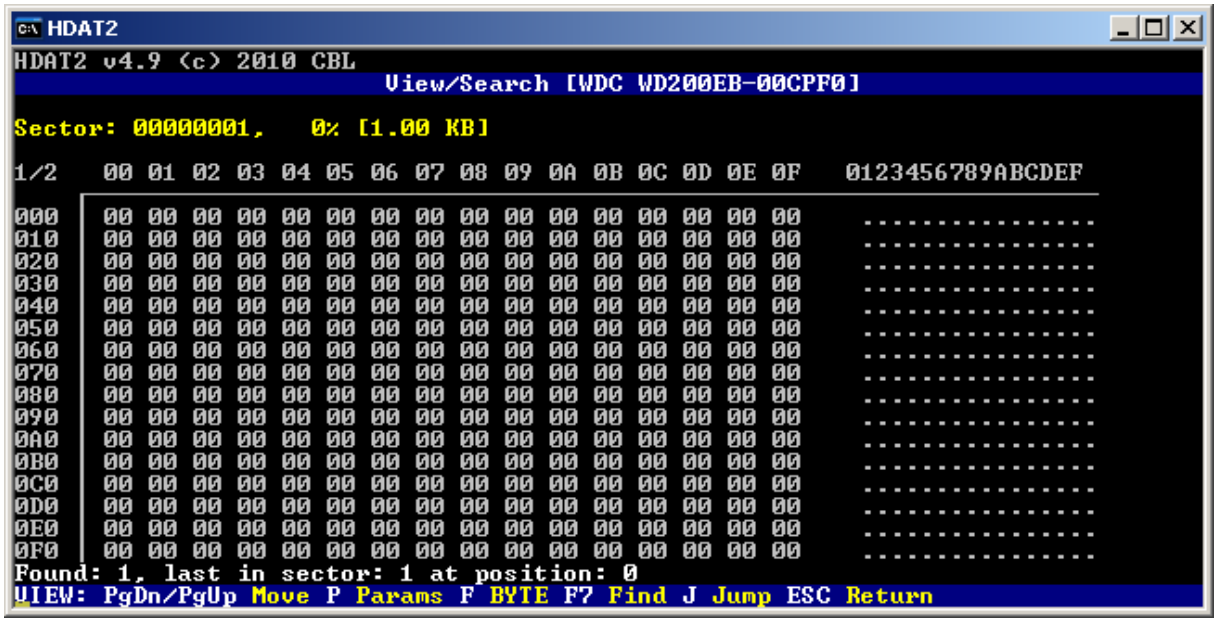


We get the first sector – master boot record (MBR).

Search for empty sector

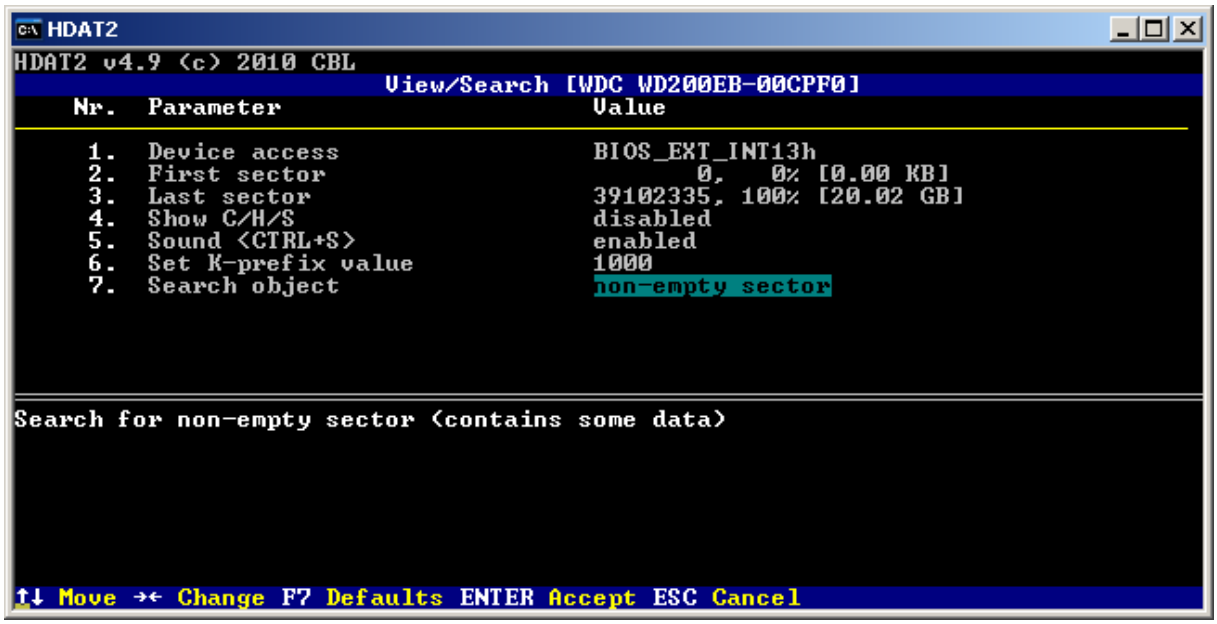
This is usable if you are looking for empty (with 00h) sector on device. In parameters menu select "empty sector".

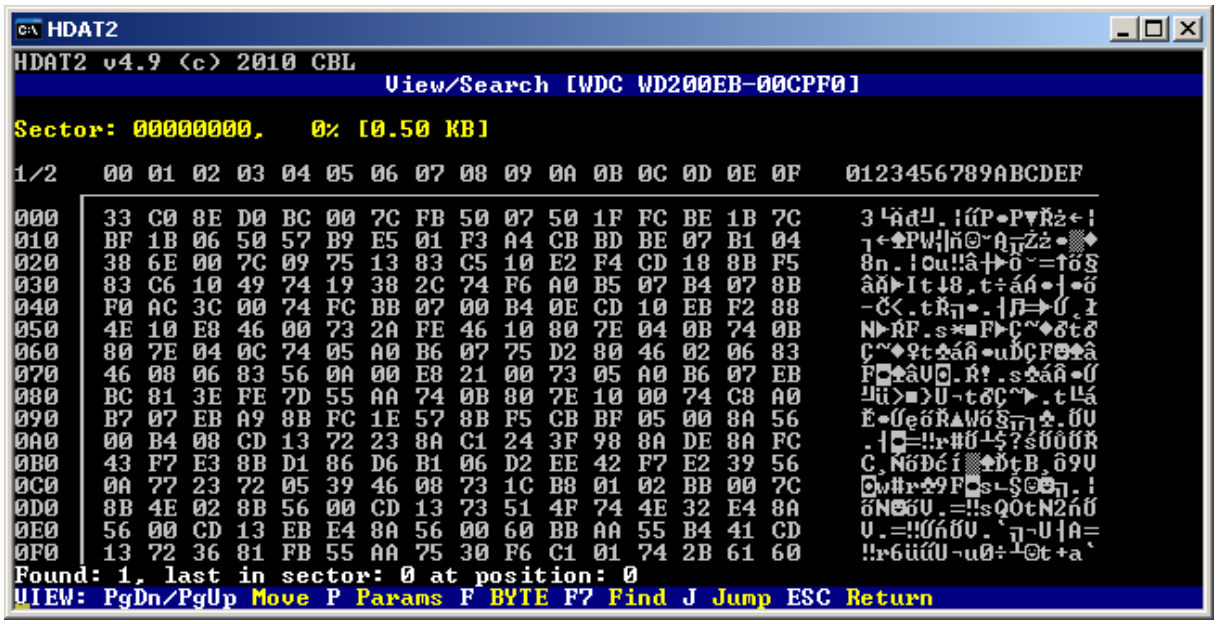

HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr. Parameter Value
1. Device access BIOS_EXT_INT13h
2. First sector 0, 0% [0.00 KB]
3. Last sector 39102335, 100% [20.02 GB]
4. Show C/H/S disabled
5. Sound <CTRL+S> enabled
6. Set K-prefix value 1000
7. Search object empty sector
Search for empty sector (contains a binary zeroes only)
↑↓ Move →← Change F7 Defaults ENTER Accept ESC Cancel

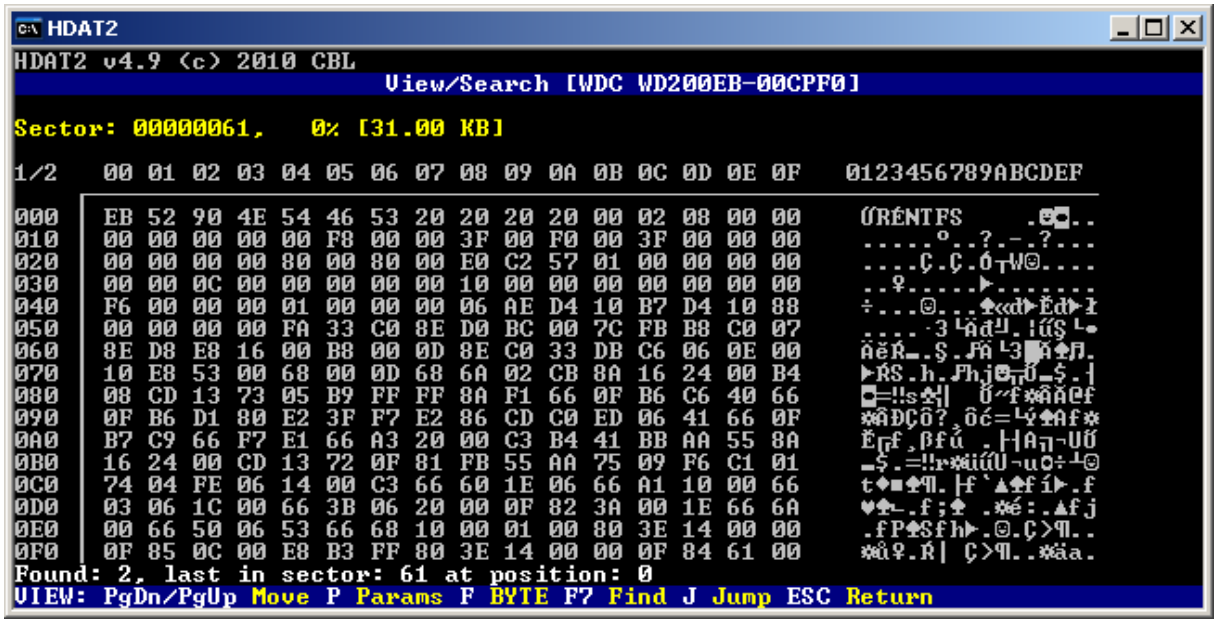


Search for non-empty sector

This is usable if you are looking for any data on device. In parameters menu select "non-empty sector".


HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Nr. Parameter Value
1. Device access BIOS_EXT_INT13h
2. First sector 0, 0% [0.00 KB]
3. Last sector 39102335, 100% [20.02 GB]
4. Show C/H/S disabled
5. Sound <CTRL+S> enabled
6. Set K-prefix value 1000
7. Search object non-empty sector
Search for non-empty sector (contains some data)
↑↓ Move →← Change F7 Defaults ENTER Accept ESC Cancel




HDAT2
HDAT2 v4.9 (c) 2010 CBL
View/Search [WDC WD200EB-00CPF0]
Sector: 00000061, 0% [31.00 KB]
1/2 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 0123456789ABCDEF
000 EB 52 90 4E 54 46 53 20 20 20 20 00 02 08 00 00
010 00 00 00 00 00 F8 00 00 3F 00 F0 00 3F 00 00 00
020 00 00 00 00 80 00 80 00 E0 C2 57 01 00 00 00 00
030 00 00 0C 00 00 00 00 00 10 00 00 00 00 00 00 00
040 F6 00 00 00 01 00 00 00 06 AE D4 10 B7 D4 10 88
050 00 00 00 00 FA 33 C0 8E D0 BC 00 7C FB B8 C0 07
060 8E D8 E8 16 00 B8 00 0D 8E C0 33 DB C6 06 0E 00
070 10 E8 53 00 68 00 0D 68 6A 02 CB 8A 16 24 00 B4
080 08 CD 13 73 05 B9 FF FF 8A F1 66 0F B6 C6 40 66
090 0F B6 D1 80 E2 3F F7 E2 86 CD C0 ED 06 41 66 0F
0A0 B7 C9 66 F7 E1 66 A3 20 00 C3 B4 41 BB AA 55 8A
0B0 16 24 00 CD 13 72 0F 81 FB 55 AA 75 09 F6 C1 01
0C0 74 04 FE 06 14 00 C3 66 60 1E 06 66 A1 10 00 66
0D0 03 06 1C 00 66 3B 06 20 00 0F 82 3A 00 1E 66 6A
0E0 00 66 50 06 53 66 68 10 00 01 00 80 3E 14 00 00
0F0 0F 85 0C 00 E8 B3 FF 80 3E 14 00 00 0F 84 61 00
Found: 2, last in sector: 61 at position: 0
VIEW: PgDn/PgUp Move P Params F BYTE F7 Find J Jump ESC Return

Frequently Asked Questions

1. **I received a 40 GB drive in replacement for a 20 GB model in PC. The drive is reported as 20 GB capacity. How can i get full capacity ?**
2. **How to bypass a Security and/or DCO frozen state ?**
3. **Can i remove non-existent bad sectors from the file table FAT ?**
4. **Connecting ATA/IDE Hard Drives**
5. **What are the differences between master/slave and cable select ?**
6. **Host Protected Area (HPA) vs. 28/48-bit LBA mode**
7. **Change of DCO Modify item is always aborted (abort command)**
8. **What is Spread Spectrum Clocking (SSC) ?**
9. **SATA NCQ / eSATA / xSATA**
10. **Can I cut down size of hard drive ?**
11. **How can I determine supported media format of CD/DVD drive ?**
12. **Portable computer with Windows Vista has problem with power consumption.**
13. **Host Protected Area (HPA) from BIOS.**
14. **The Hidden Protected Area (hidden partition).**
15. **I cannot remove Host Protected Area (HPA) on Dell notebook (Media Direct HPA).**
16. **I cannot read SMART for USB/Firewire hard drives.**
17. **Western Digital WD5000KS doesn't spin-up (firmware bug).**
18. **How to non-destructively convert dynamic disks to basic disks.**
19. **Hard disk doesn't spin up - PUIS (Power Up In Standby).**
20. **Windows support for logical units larger than 2 TB.**
21. **GUID partition table (GPT) disks.**

Q1: I received a 40 GB drive in replacement for a 20 GB model in PC. The drive is reported as 20 GB capacity. How can i get full capacity ?

A1: If you see in 'Device List' menu at your disk drive a notice '!SET MAX: HPA IS ACTIVE', use 1. method, otherwise use 2. method.
In program HDAT2 select your disk drive and press Enter to show 'Main Menu'.

1. method:

In 'Device List' menu at your disk drive you see notice '!SET MAX: HPA IS ACTIVE'. Select 'SET MAX (HPA) Menu', then select 'Set Max Address' and press Enter. By default is set so called native size of disk drive disku and you can just press a key 'S' to setup original capacity of hard drive and remove HPA area.
If the command is aborted, try change 'LBA mode' from 28 to 48 or vice versa (if disk supports 48-bit LBA mode).

2. method:

Select 'Device Configuration Menu', then select 'Restore' and press Enter. If you don't see any error message, in 'Device List' menu press a key 'D' to make new detection of devices or simple make restart of PC's and check capacity of your hard drive.
If you see any error message or in 'Device List' menu at your disk you see a notice '! DCO: FROZEN', then it is possible that BIOS was sent a command DCO Freeze and all subsequent DCO commands will be aborted now. How to try bypass this state see answer nr. 2.

Q2: How to bypass a Security and/or DCO frozen state ?

A2: Turn off PC, remove ribbon (data) cable from this hard drive (not the power cable), turn on PC and after boot from floppy you can connect ribbon (data) cable back to hard drive and start up HDAT2. Don't worry - program can detect this device.

Notice: this is valid only for PATA drivers, not for SATA drivers.
If you have SATA drive in Security and/or DCO frozen state, simple solution is connect this drive to PC with BIOS which doesn't set security mode.

Q3: Can i remove non-existent bad sectors from the file table FAT ?

A3: Yes, with file-system version program HDAT2FS or HDAT2 you can test FAT12/16/32.

select your drive and press Enter to run Menu
select 'File Level Tests Menu' and press Enter
select 'Read File System from MBR' and press Enter
for item 'All' press 'C' to check detected items
goto to 'Table' item and 2-times press Enter to run Utility menu
press 'T' to setup test for file table FAT
if you want to update file table press 'W' for update
press Enter to run
This procedure will first compare both FAT copies and second tests all FAT entries for bad sectors. If program will find 'bad sector' entry, then all sectors in this cluster will be tested. If all these sectors are not bad program will remove this record of bad sectors.

Q4: Connecting ATA/IDE Hard Drives

A4: ATA/IDE devices use a ribbon cable to connect to each other. Ribbon cables have all of the wires laid flat next to each other instead of bunched or wrapped together in a bundle. IDE ribbon cables have either 40 or 80 wires. There is a connector at each end of the cable and another one about two-thirds of the distance from the motherboard connector. This cable cannot exceed 18 inches in total length (12 inches from first to second connector, and six inches from second to third) to maintain signal integrity.
40-wire Cables

On the slower older 40-wire ATA cables, the Slave device, usually a CD-ROM or CD-ROM recorder/burner still goes on the END, but you need to set the jumpers as Slave. This is true even if you don't have a hard drive in the Master position. The Master for 40-wire cables goes on the the Middle connector.

If you want to use the cable select with the older drive on a 40-wire cable, you'll have to consult the maker of the drive for the instructions.

80-wire Cables

On the ATA66/100/133 standard 80-wire cable, the Master hard drive or your boot hard drive goes on the END of the cable. This is true whether or not you use the Master/Slave style or the Cable Select style.

The 40-pin 80-conductor cable is orientation specific. The cable connectors are color-coded: blue for the host connector, black and gray for the primary and secondary disk drives. The blue connector should be installed into the Primary IDE connector.

The blue connector attaches to the motherboard.
The black connector attaches to the primary, or master, drive.
The gray connector attaches to the secondary, or slave, drive.

Along one side of the cable is a stripe. This stripe tells you that the wire on that side is attached to Pin 1 of each connector. Wire 20 is not connected to anything. In fact, there is no pin at that position. This position is used to ensure that the cable is attached to the drive in the correct position. Another way that manufacturers use to make sure that the cable is not reversed is by using a cable key. The cable key is a small plastic square on top of the connector on the ribbon cable that fits into a notch on the connector of the device. This allows the cable to attach in only one position.

Q5: What are the differences between master/slave and cable select ?

A5: Two different protocols can be used for jumpering ATA devices, including hard disk drives. One is the master-slave relationship. With this protocol, one device is jumpered as master and the other is jumpered as slave. The second protocol is cable select. With this protocol, both devices are jumpered as cable select and their position on the cable dictates which is the master and which is the slave. The end device is master while the device on the middle of the cable is slave. You can use either of these protocols but you cannot mix them on the same data cable.
Computers that use cable-select determine the master and slave drives by selecting or deselecting pin 28, CSEL, on the interface bus. Master and slave drives are determined by their physical position on the cable.

Configuration Using Cable Select

Cable Select is defined in the ATA-2 and ATA-3 specifications and is part of the ATA PnP standard and Microsoft's PC97 standard.

The standard 40-wire ATA ribbon cable and the 80-wire cable give different drive behavior when using Cable Select. If using the standard 40-wire cable, the Master goes in the middle connector and the Slave goes in the end connector. If using the 80-wire cable, attach the blue end connector to the system board or host controller, the gray middle connector to the Slave, and the black end connector to the Master.

All newer ATA hard drives can be jumpered as Cable Select (CS or CSEL). This is an alternate way to indicate which drive is master and which drive is slave (instead of jumpering one drive as master and one drive as slave). Cable Select jumpering requires a special IDE cable with wire 28 not connected to one of the drive connectors, which would configure the drive attached to that connector as the slave drive.

In order to use Cable Select jumpering, several conditions must be met. Both drives on a channel must support CSEL, both drives must be jumpered as CSEL, a CSEL cable must be used, and the host interface connector must support CSEL. For the host interface to support Cable Select, wire 28 must be grounded.

Although the Cable Select specification may simplify things in the future, there will probably be lots of confusion, especially on legacy systems, as this starts to be introduced. One problem will be in selecting the correct cable. Supposedly, the cables used for Cable Select will be clearly marked, with each connector labeled as Device 0 (or Master) or Device 1 (or Slave). If not clearly marked, it may not be easy to identify a CSEL cable visually. wire 28 can be checked for continuity.

A Cable Select cable can be constructed in various ways. Pin 28 may be non connected to the connector at the end of the cable or to the connector in the middle of the cable. Another design would have the host interface connector in the middle and the two drives would plug into each end of the cable, with the connector at one of the ends not connected to pin 28.

If both drives are set for CSEL and the host interface supports CSEL, but a regular cable is used, both drives will be seen as master.

A Cable Select cable can be used with master/slave drive jumpering.

Another problem will be with host interfaces on legacy motherboards and controller cards. If pin 28 is not grounded on the host interface, drives connected to either connector on the CSEL cable will be seen as slave. It will be common to find that pin 28 is open or high on many older IDE interfaces. This can be checked with a voltmeter.

Q6: Host Protected Area (HPA) vs. 28/48-bit LBA mode

A6: There is a problem of incompatibility on some hard drives (e.g. Seagate and/or in an external Maxtor One Touch) when you are using 48-bit command for removing Host Protected Area (HPA) created with 28-bit command.
48-bit command cannot remove HPA created with 28-bit command and vice-versa.
Following solution is for disk supports 48-bit LBA mode only and if you have HPA greater than 127 GB.
Notice:

"Some vendor-specific external drive enclosures (Maxtor) are known to use HPA to limit the capacity of unknown replacement hard drives installed into the enclosure. When this occurs, the drive may appear to be limited in size (e.g. 128 GB). In this case, one must use software utilities that use READ NATIVE MAX ADDRESS and SET MAX ADDRESS to change the drive's reported size back to its native size."

Solution:

1. Power-on PC, boot and start HDAT2.
2. In 'SET MAX (HPA) Menu' select 'Set Max Address'. Change 'LBA mode' from 48 to 28-bit LBA mode and press 'S' key to set maximal address for 28-bit LBA mode (127 GB).
3. Power-off PC (Important !), power-on PC, boot and start HDAT2.
4. In 'SET MAX (HPA) Menu' select 'Set Max Address'. Leave the selected 48-bit 'LBA mode' (or change 'LBA mode' from 28 to 48-bit LBA mode) and then press 'S' key to set maximal address for 48-bit LBA mode.
5. After restart you should get the full (native) capacity of hard drive.

Q7: Change of DCO Modify item is always aborted (abort command)

A7: Some hard drives (Maxtor) allow to modify DCO always, the other hard drives (Seagate) allow to modify DCO one times only.
Example of the restrictions on changing of bits:

If a user attempts to change maximum LBA address (SET or RESTORE) after establishing a protected area with SET MAX address, the device will abort that command.

If the user attempts to disable Security feature when the device is enabled and the Security feature is set, the device will abort that command.

If you always got an error message (aborted command) when you want to change any item in DCO Modify menu, you should first run a 'Restore' item to restore default settings and then you can go to Modify menu.

Q8: What is Spread Spectrum Clocking (SSC) ?

A8: Spread Spectrum Clocking is a way to lower electromagnetic interference or EMI. This is important for storage solutions that are required to pass FCC and other agency certifications. Today, some Serial ATA disk drives implement SSC, some allow you to turn this feature on/off, and some do not implement SSC; it is anticipated that all will implement this feature in the near future.
The technique of modulating the operating frequency of a circuit slightly to spread its radiated emissions over a range of frequencies rather than just one tone. This reduction in the maximum emission for a given frequency helps meet FCC requirements.

Newer Serial ATA (3Gbps SATA) interface disc drives may employ a standard technology called Spread Spectrum Clocking (SSC) which helps to reduce electronic emissions (EMI) in large, multi-drive systems. Single drive environments do not need SSC to meet EMI requirements.

3Gbps means doubled interface speeds, which also means greater signal noise and electromagnetic emissions. As in the processor settings in many motherboards' BIOSes, spread spectrum clocking can reduce emissions to meet regulations.

In a single-drive environment, it's not necessary, but when you've got two or more drives, and they're all running at 3Gbps, that's when you've got a lot of electrical noise going on, and the spread spectrum feature is recommended. This is more for safety than reducing data errors, which most drives' ECC code will correct automatically.

A small number of SATA host products do not support this SSC standard feature. Similarly, RAID controllers may need to enable SSC on drive configurations with SSC disabled by default to reduce EMI.

Disable SSC: Host products that do not support SSC cannot detect the presence of the disc drive. Therefore, in order to disable SSC the drive must be attached to another host platform that does support SSC so that the feature can be disabled. Once SSC is turned off, the drive can be returned to the original host system.

Enable SSC: If the drive has SSC turned off by default and SSC is required for a large multi-drive environment, the target system is usually supported by the SSC software. RAID controllers, however, can pose a barrier to communicating with the SATA at the low hardware level required to make the SSC change. If your RAID controller is not supported then a more standard SATA system may be needed to toggle SSC on the drive. Once SSC is turned on, the drive can be returned to the original RAID controller.

There are many accounts on the Internet about problems arising from HBAs (Host Bus Adapter) not supporting SSC as required. Disk drive vendors that tried turning on SSC have had to provide consumers special programs or jumpers to turn SSC off so they will work in non-compliant systems.

Intel
Apple
Apple discussions
SeriTek controller/Hitachi hard disks
Seagate
Western Digital
Hitachi

Due to this problem, users believe that SATA 3Gb/s HDD's are not compatible with SATA 1.5Gb/s controllers. This is inaccurate as the technology is definitely backwards compatible.

Q9: SATA NCQ / eSATA / xSATA

A9: NCQ: NCQ (Native Command Queuing) debuted in many 1.5Gbps drives as a refinement of earlier CQ schemes used in SCSI drives. When a supporting controller sends NCQ-enabled commands to a drive, the drive will intelligently prioritize up to 32 of those commands before performing the reads/writes. Because the controller triggers CQ, the user can enable/disable it in the OS, as from Windows XP's Device Manager. That applications that take advantage of the multithreading features of dual-core and/or Hyper-Threaded processors should complement NCQ for faster throughput.
Explains Native Command Queing (NCQ) Seagate
eSATA: More of a cable and connector redesign than a fundamental change, eSATA means data cables with better shielding and connectors that are harder to accidentally dislodge or break. The external drive's power is still supplied separately. eSATA headers are rectangular instead of L-shaped, so eSATA cables won't work inside most PCs. The working group came up with eSATA to address the fact that users were already connecting SATA drives externally because the interface outpaces USB 2.0 and FireWire 800Mbps. Shielding that was adequate for use inside a computer case, wasn't good enough outside the box.

xSATA: This option allows the use of much longer external data cables of up to 8 meters in length.

Q10: Can I cut down size of hard drive ?

A10: Yes. In 'Device List' menu select your disk drive. Select 'SET MAX (HPA) Menu', then select 'Set Max Address' and press Enter. Now you can choose your required size of hard drive. It should be smaller as native (maximal) size of drive, of course. See also question nr. 1.

Q11: How can I determine supported media format of CD/DVD drive ?

A11: In 'Device List' menu select your CD/DVD drive. Select 'Device Information Menu', then select 'Get Configuration' and press Enter. Now you will see list of supported profiles of your drive.

Q12: Portable computer with Windows Vista has problem with power consumption.

A12: Power consumption may be slightly more than expected on a portable Windows Vista-based computer that uses a SATA hard disk that does not support Host-Initiated Link Power Management.
This problem may occur if the SATA hard disk does not support HIPM. In this case, Windows Vista may not use DIPM for power management. Therefore, the Windows Vista power management feature is less able to efficiently manage power consumption.
See MS Article ID: 932079.

Q13: Host Protected Area (HPA) from BIOS.

A13: Some motherboards has incorporated the HPA feature in the BIOS. This feature allows information contained in the first partition of the Hard Drive to be copied to a hidden HPA partition on the same drive where it is immune from attack.
If the HPA is removed from the HD the area of use will be available at the end of the drive as 'Unallocated'.
E.g. Gigabyte's Xpress Recovery.

Q14: The Hidden Protected Area (hidden partition).

A14: The Hidden Protected Area is a special area (hidden partition) (usually a few gigabytes in size) located at the end of a hard disk. It is preinstalled on the harddisks of some PC's (e.g. IBM). It is normally hidden to the software running on this PC. It includes all the software and data needed to recover the preloaded state of the PC. This HPA also includes some diagnostic tools and a backup tool. Some vendors are using the HPA instead of providing rescue media.
It is referred to as the Predesktop Area in the BIOS Setup Utility. That hidden partition is not an HPA.

Q15: I cannot remove Host Protected Area (HPA) on Dell notebook (Media Direct HPA).

A15: With HDAT2 program you did the first half of the fix but missed the second part. The Dell MBR (Master Boot Record at sector 0) calls special code in LBA sector 3 to re-enable the HPA anytime you boot from the hard disk. After you unhide the HPA, in order for it to stay unhidden you need to either get rid of the Dell MBR (so LBA-3 doesn't get called) or you need to disable LBA-3 (wipe LBA sector 3). (search on Google for 'dell hpa mediadirect')

Q16: I cannot read SMART for USB/Firewire hard drives.

A16: It all depends on the chip your USB/Firewire enclosures with drive have. The protocol USB-IDE bridge between the USB and ATA protocols should support SMART data and correctly send SMART data over those interfaces. If you cannot see the SMART menu, your drive cannot send SMART data.
Supported bridge chips: Cypress, JMicron and Oxford.
E.g. Western Digital Passport is using Cypress AT2+ USB/ATA interface.

Q17: Western Digital WD5000KS doesn't spin-up (firmware bug).

A17: Taken over from Google Notebook.
If any controller or software you have enables the "Power-up in Standby" feature on these drives, you can not disable it. In fact, once that mode is enabled, the drive reports conflicting information.
Western Digital said on the phone the KS line of drives are not a high-enough priority for them to fix the firmware.

Q18: How to non-destructively convert dynamic disks to basic disks.

A18: Read this instruction disk_probe.pdf.

Q19: Hard disk doesn't spin up - PUIS (Power Up In Standby).

A19: The optional Power-Up In Standby (PUIS) feature set allows devices to be powered-up into the Standby power management state to minimize current at power-up and to allow the host to sequence the spin-up of devices.
This optional feature set may be enabled or disabled via the SET FEATURES command or may be enabled by use of a jumper, or both. When enabled by a jumper, this feature set shall not be disabled via the SET FEATURES command.

Once this feature is enabled in a device, the device shall not disable the feature as a result of processing a power-on reset, a hardware reset, or a software reset.

If the device implements this SET FEATURES subcommand and power-up into Standby is enabled, the device shall remain in Standby until the SET FEATURES subcommand is received.

If the device does not implement the SET FEATURES subcommand to spin-up the device after power-up and PUIS is enabled, the device shall spin-up upon receipt of the first command that requires the device to access the media, except the IDENTIFY DEVICE command or the IDENTIFY PACKET DEVICE command.

Solution for HDAT2 program: if you have a hard disk with enabled PUIS (cannot spin up and BIOS cannot recognize this drive) run program with parameter /W Wake/Spin-up the drive:

HDAT2 /W

List of parameters: HDAT2 /? or HDAT2 /h.

Q20: Windows support for logical units larger than 2 TB.

A20: Disk devices with more than 2 TB of disk space must be converted to GPT format for all of the disk space to be usable. If the device uses MBR format, the disk space beyond 2 TB will be unusable.

Q21: GUID partition table (GPT) disks.

A21: A GPT disk uses the GUID partition table (GPT) disk partitioning system. A GPT disk offers these benefits:

Allows up to 128 primary partitions. (MBR disks can support up to four primary partitions and an infinite number of partitions inside an extended partition.)
Allows a much larger volume size - greater than 2 TB, which is the limit for MBR disks.
Provides greater reliability due to replication and cyclical redundancy check (CRC) protection of the partition table.

Can be used as a storage volume on all x64-based platforms, including platforms running Microsoft Windows XP Professional x64 Edition. Windows Server 2003 SP1 also enables support for GPT in x86 versions of the Windows Server 2003 family.
Notes:
Unlike Windows support for the Intel Itanium platform, Windows x64 Edition and Windows Server 2003 SP1 operating systems support the use of GPT drives only as data volumes. Because the x64 and x86 architectures do not provide support for an EFI boot partition, you cannot use a GPT drive to boot an x64-based computer or an x86-based computer with a legacy BIOS. Therefore, computers running these operating systems must be equipped with more than one physical driver to allow the use of the GPT disk format.

On Intel Itanium platforms, Windows supports the use of GPT drives as boot drives or data volumes.

You can convert only empty, unpartitioned disks (raw drives or empty MBR drives) to the GPT format. To convert a volume that contains data, you must first manually delete the partition.
GPT is part of the EFI specification.

Extensible Firmware Interface (EFI) describes an interface between the operating system and the platform firmware.

Unified Extensible Firmware Interface (UEFI) http://www.uefi.org/
UEFI computers require at least three GPT partitions:

1. An EFI system partition (ESP) to store the boot applications and other related information (EFI drivers). Windows does not assign a driver letter to the ESP. This partition should not be used for any user or application data files.

2. A Microsoft reserved (MSR) partition, which must be located between the ESP and the Windows operating system partitions.

3. A Windows system partition.